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ABSTRACT

This report describes a field application of the Computer Automated Page Layout (PLA) system to the development of a procedure training aid for the SH-3D/H Helicopter, as part of the Training Analysis and Evaluation Group's (TAEG) ongoing development effort to provide tools for the design and publication of technical training aids in a format which relies heavily on graphics for use in teaching procedures. It describes the steps required to use PLA in the design and production of the "Procedure Training Aid for the SH-3D/H Systems Checklist," which contains numerous photographs and line drawings. Also included is a summary of opinions of students and instructors concerning the training aid's usefulness. On the basis of this demonstration, it is concluded that the PLA computer aided authoring routines can be used in developing procedure training aids, and that aids developed using PLA can support the learning of complex procedures and will be accepted by both students and instructors. It is recommended that PLA be used to develop training materials when the procedures must be performed from memory or a simple checklist; are difficult to learn; and/or are for operation of the equipment. A six-item reference list includes several related reports available from NTIS (National Technical Information Service). Appendices provide a biographical description of the author and 34 pages of the 65-page procedure training aid prepared for this project by Richard C. Ewell using the PLA system. PLA operates on the WANG 2200 MVP minicomputer. (LMM)

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TAEG

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TECHNICAL NOTE 12-83

# THE DESIGN AND PRODUCTION OF A PROCEDURE TRAINING AID USING THE PROCEDURE LEARNING FORMAT AND THE COMPUTER-AUTOMATED PAGE LAYOUT (PLA) ROUTINE

DECEMBER 1983

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# THE DESIGN AND PRODUCTION OF A PROCEDURE TRAINING AID USING THE PROCEDURE LEARNING FORMAT AND THE COMPUTER AUTOMATED PAGE LAYOUT (PLA) ROUTINE

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# SECTION I

## INTRODUCTION

The rapid introduction of increasingly complex military equipment has resulted in a major requirement for the timely development of more effective materials to train personnel in the performance of operation and maintenance procedures (Braby, Hamel, and Smode, 1982). The Training Analysis and Evaluation Group (TAEG) of the Naval Training Equipment Center has developed a learning format which increases the efficiency with which procedures are taught. This format relies heavily on graphics and uses words where necessary to clarify the meaning of the graphics. While documents based on the format are highly successful as procedure training aids and job performance aids (Scott, McDaniel, and Braby, 1982) these documents are expensive and time consuming to design and produce.

The TAEG has responded to this problem by developing the computer automated page layout system (Babu and Sylla, 1981) which significantly reduces the time and effort required to produce text-graphic materials. The Computer Automated Page Layout (PLA) for Text-Graphic Materials User's Guide (Terrell, 1982) provides the subject matter expert an independent means to learn to use these computer routines to design and produce training aids.

## PURPOSE

This report describes the field application of the PLA to the development of a procedure training aid for the SH-3D/H Helicopter. The demonstration is part of the TAEG development effort to provide tools for the design and publication of training aids.

## BACKGROUND

The PLA system for laying out procedure training aids is part of a TAEG effort to improve the Navy's efficiency in publishing technical training information for use in teaching procedures.

This effort has included:

- identification of a set of learning guidelines for teaching procedures (Aagard and Braby, 1976)
- development of a learning algorithm incorporating these guidelines (Aagard and Braby, 1976)
- development of formats for text-graphic pages to be used in teaching procedures (Polino and Braby, 1980; Braby, Hamel and Smode, 1982)*

*These projects were supported by the Naval Technical Information Presentation Program (NTIPP) which is a project of the David W. Taylor Naval Ship Research and Development Center.

- development of computer routines to automatically format text-graphic pages (Babu and Sylla, 1981)*
- development of a handbook for using the computer-based formatting routines (Terrell, 1982)*
- field trial of the computer-based formatting routines.

In addition to formats for procedure learning, TAEG has developed computer-based algorithms for producing symbol learning materials. Current efforts are directed toward automating the production of documents such as instructor guides, student guides, and training manager guides. In addition, the procedure training aid formats are being adapted for use in computer-assisted instruction. This is a departure from past work which focused on the design of aids for authors to use in producing paper documents.

This report describes a field use of the first generation PLA routine which operates on the WANG 2200 MVP minicomputer. The basic steps in the use of this routine are:

- The author enters procedure data which includes:
  - steps in the procedure
  - dimensions of pictures for each step
  - text for labels
  - picture-label relationships
  - page headers and footers
- The computer:
  - selects optimum page layouts
  - draws boxes for pictures and labels
  - puts text in label boxes
  - draws lines between related pictures and between labels and pictures
  - types headers and footers
- The author:
  - resolves layout problems that cannot be solved by the PLA routines
  - places pictures in designated boxes
  - places adhesive-backed darts over the lines between pictures and text drawn by the computer
  - ensures that the material is camera ready.

*These projects were supported by the Naval Technical Information Presentation Program (NTIPP) which is a project of the David W. Taylor Naval Ship Research and Development Center.

Plans call for implementing these routines on a MODCOMP minicomputer as a part of the NTIPP authoring work station. Other variations in the PLA routines will be made as needs arise and resources are available.

Procedure training aids have special publishing requirements which render traditional publishing approaches excessively expensive. These special requirements include:

- extensive use of photographs, line art, and text on each page
- frequent updating of text and illustrations to maintain the currency of the procedure being trained
- a small number of copies for use at any specific time.

Print-on-demand publishing, using reproduction equipment which has photo contrast control (e.g., the Xerox 9500) is a cost-effective approach to meet these requirements. A reproduction system with photo contrast control utilizes an electronic screen which permits adequate quality halftone reproduction of photographs along with text in a single step process.

Traditional publishing techniques require large press runs to bring costs down to an acceptable level. Since procedure training aids are frequently updated, it is not advisable to print more than is required for immediate instructional needs. The Procedure Training Aid for SH-3D/H Systems Checklist is a 65-page procedure training aid which can be reproduced in single copies or small quantities for about $2.50 a copy by the Navy's Publication and Printing Office using the Xerox 9500. Appendix B, a copy of a PLA generated training aid, was reproduced in this manner.

The next section provides a discussion and analysis of the preparation of the procedure training aid. It includes observations on the value of the PLA routines, the author's guide, and the usefulness of PLA-generated material in a Navy school.

## SECTION II

## PREPARATION AND EVALUATION OF A PROCEDURE TRAINING AID CREATED WITH PLA

This section describes the effort required to use PLA in the design and production of the Procedure Training Aid for SH-3D/H Systems Checklist. Also included is a summary of opinions of students and instructors concerning the usefulness of the training aid.

**AUTHOR.** The author of the Procedure Training Aid for SH-3D/H Systems Checklist is an experienced helicopter pilot and flight instructor. Although he had very limited prior experience with computers, the author was able to master the PLA system quickly. The rapid development of this proficiency was attributed to the use of a draft version of the PLA user's guide for both initial training and as a subsequent reference aid.

**USER'S GUIDE.** The draft guide used by the author provided step-by-step directions in the design, preparation, computer input, and printing of text-graphic pages. Text-graphic pages were used extensively throughout the user's guide to illustrate the steps. These pages were created with PLA and further illustrate the use of the PLA routines. (Subsequently, the guide was published as the Computer Automated Page Layout (PLA) for Text-Graphic Materials: User's Guide (Terrell, 1982)).

**PLA SYSTEM UTILITY.** Having had some experience in writing and producing training materials, the author quickly realized the value of the PLA in laying out a training aid. The Procedure Training Aid for SH-3D/H Systems Checklist teaches nine items of an eleven item checklist. The Navigator and Coupler/Doppler checks will be covered in separate training aids. The present module requires 65 pages which includes 53 text-graphic pages. Actual production time for the training aid was 1½ months in the squadron working environment in which collateral duties were performed while working on the training module. The planning and script writing phase took approximately 1 week; setting up and shooting photographs, 1 week; sizing of photos, measurements, and computer entry, 2 weeks; and final photo mounting on the finished pages, set up of accessory pages, and printing, 2 weeks. Pages not developed with PLA were produced with the aid of an A-B Dick word processor. The author of the Procedure Training Aid served as photographer and typist for the project, a situation he recognizes may not be possible at other sites.

**STUDENT/INSTRUCTOR REACTION.** Five consecutive Helicopter Squadron One pilot training classes have learned the SH-3D/H Systems Checklist using the procedure training aid. The pilot training officer reported that "each of the thirty-eight (38) students had a positive reaction to the training aid. It has reduced training time in both ground and in-flight training and has standardized the performance of the procedure across the student population."

A brief 11-item questionnaire was given to 10 students to elicit their opinion of the utility of the procedural training aid to learn the complex SH-3D/H Systems Checklist procedure. Sample questions and student responses follow:

Describe the overall value of the Procedural Training Aid as a means to learn the SH-3 Systems Checklist. The mean of the responses on a 5-point scale from poor (1) to outstanding (5) was 4.1 or excellent.

Are the reviews and self-checks properly spaced in the training aid? Six of the 10 responses were that reviews and self-checks were too frequent and too many. (It should be noted that if the format model for procedure training, included in the user's guide, had been more closely followed, there would have been fewer reviews and self-checks.)

Describe the clarity of the illustrations in the training aid. The mean response on a 5-point scale from poor (1) to outstanding (5) was 3.6, good to excellent. These responses are of particular importance given that the training aid was produced using the low cost Xerox 9500 reproduction system.

Describe the adequacy of the narrative text for the items. The mean response on a 5-point scale from poor (1) to outstanding (5) was 3.8, good to excellent.

Did you require help from an instructor to complete the Training Aid (yes/no)? Nine of the 10 responses were no, an indication that the training aids were used effectively as independent study material.

The training officer also reported numerous requests by students for additional training aids covering other complex procedures that must be mastered during SH-3 transition training. The Coupler-Doppler Checks and the Emergency Procedures Checklists were among the most frequent requests for future development of training aids. A Pre-Flight Inspection procedure training aid has recently been developed and is now being tested.

## SECTION III

## CONCLUSIONS AND RECOMMENDATIONS

### CONCLUSIONS

Several tentative conclusions can be reached as a result of this demonstration:

- The PLA computer aided authoring routines can be used by training commands to aid in developing procedure training aids.
- Procedure training aids developed in this manner can support the learning of complex procedures and will be accepted by both students and instructors.
- Print-on-demand publishing using electro-static copiers with photo contrast control is an economical way to reproduce photo illustrated procedure training aids.

### RECOMMENDATION

At this time, it is recommended that the PLA routine be used for the development of training materials when the procedures:

- must be performed from memory or from a simple checklist
- are difficult to learn
- are for operation of the equipment.

## REFERENCES

Aagard, J. A. and Braby, R. Learning Guidelines and Algorithms for Types of Training Objectives. Technical Report 23, 1976. Training Analysis and Evaluation Group, Orlando, FL 32813. (AD A023066)

Babu, A. J. G. and Sylla, C. Generation of an Efficient Course Manual Page Layout: A Ranking Approach. Report No. 81-82, September 1981. Department of Industrial Engineering, State University of New York at Buffalo, NY.

Braby, R., Hamel, C. J., and Smode A. F. Handbook of Format Models for Designers of Technical Training Materials. Technical Report 129, 1982. Training Analysis and Evaluation Group, Orlando, FL 32813. (AD A124129)

Polino, A. M. and Braby, R. Learning of Procedures in Navy Technical Training: An Evaluation of Strategies and Formats. Technical Report 84, 1980. Training Analysis and Evaluation Group, Orlando, FL 32813. (AD A084067)

Scott, P. G., McDaniel, W. C., and Braby, R. Improved Procedures Through Use of Aids Developed from Learning Guidelines. Technical Report 113, 1982. Training Analysis and Evaluation Group, Orlando, FL 32813. (AD A113109)

Terrell, W. R. Computer Automated Page Layout (PLA) for Text-Graphic Materials: User's Guide. Technical Report 137, 1982. Training Analysis and Evaluation Group, Orlando, FL 32813. (AD A124146)

# APPENDIX A

# BIOGRAPHICAL DESCRIPTION OF AUTHOR

LCDR Ewell, the author of the Procedure Training Aid for SH-3D/H Systems Checklist, is a certified secondary school teacher. His previous teaching experience included a 2½ year tour as a flight instructor at Helicopter Training Squadron Eight and 2½ years with the Royal Saudi Air Force Maintenance Training Assistance Program. During the latter, he developed a variety of audio-visual training aids, including programmed texts, study guides and workbooks, but none involved the use of a computer.

LCDR Ewell's experience with computers was limited to use of the Aviation Training Support System (ATSS) computer at his present squadron, Helicopter Antisubmarine Squadron One, NAS Jacksonville, Florida. Though there are some basic similarities between the ATSS's Digital Corporation PDP1170 and the PLA system's WANG 2200, there were enough differences that the use of the WANG computer was essentially a completely new experience.

# APPENDIX B

## PROCEDURE TRAINING AID FOR SH-3D/H SYSTEMS CHECKLIST

NOTE: The Procedure Training Aid contained in this appendix retains its original page numbers. It has not been renumbered to conform to the page number sequence of this technical note.

WAF 20000

Procedure Training Aid
for

# SH-3D/H SYSTEMS CHECKLIST

## NOVEMBER 1982

TRAINING DEPARTMENT
NAS Jacksonville, Florida 32212

# PROCEDURE TRAINING AID FOR LEARNING THE SYSTEMS CHECKLIST IN THE SH-3 D/H AIRCRAFT

Prepared by

LCDR. Richard C. Ewell
Helicopter Antisubmarine Squadron ONE
Jacksonville, Florida

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## INTRODUCTION/LEARNING OBJECTIVE

1. Learning Objective: When you complete this package, you will be able to:

   a. describe each item in the NATOPS SH-3 D/H Systems Checklist, using the checklist and the paper mockup of the cockpit.

   b. perform each item on the SH-3 Cockpit Procedures Trainer, or the SH-3 Motion Based Trainer, without hesitation, error, or omission.

2. Why learn this procedure? NATOPS requires the use of the Systems Checklist prior to No. 2 engine start and rotor engagement.

3. Resources required: In addition to this booklet, you will need:

   a. a paper mock-up of the SH-3 cockpit.

   b. a NATOPS SH-3 D/H SYSTEMS CHECKLIST (also reprinted on page v.).

   c. the SH-3 Cockpit Procedures Trainer or the Motion Based Trainer (used only in the final phase of the lesson).

4. Cockpit Description: The SH-3 cockpit is divided into sections. Figure 1 shows the locations and names of the sections involved in the Systems Checklist.

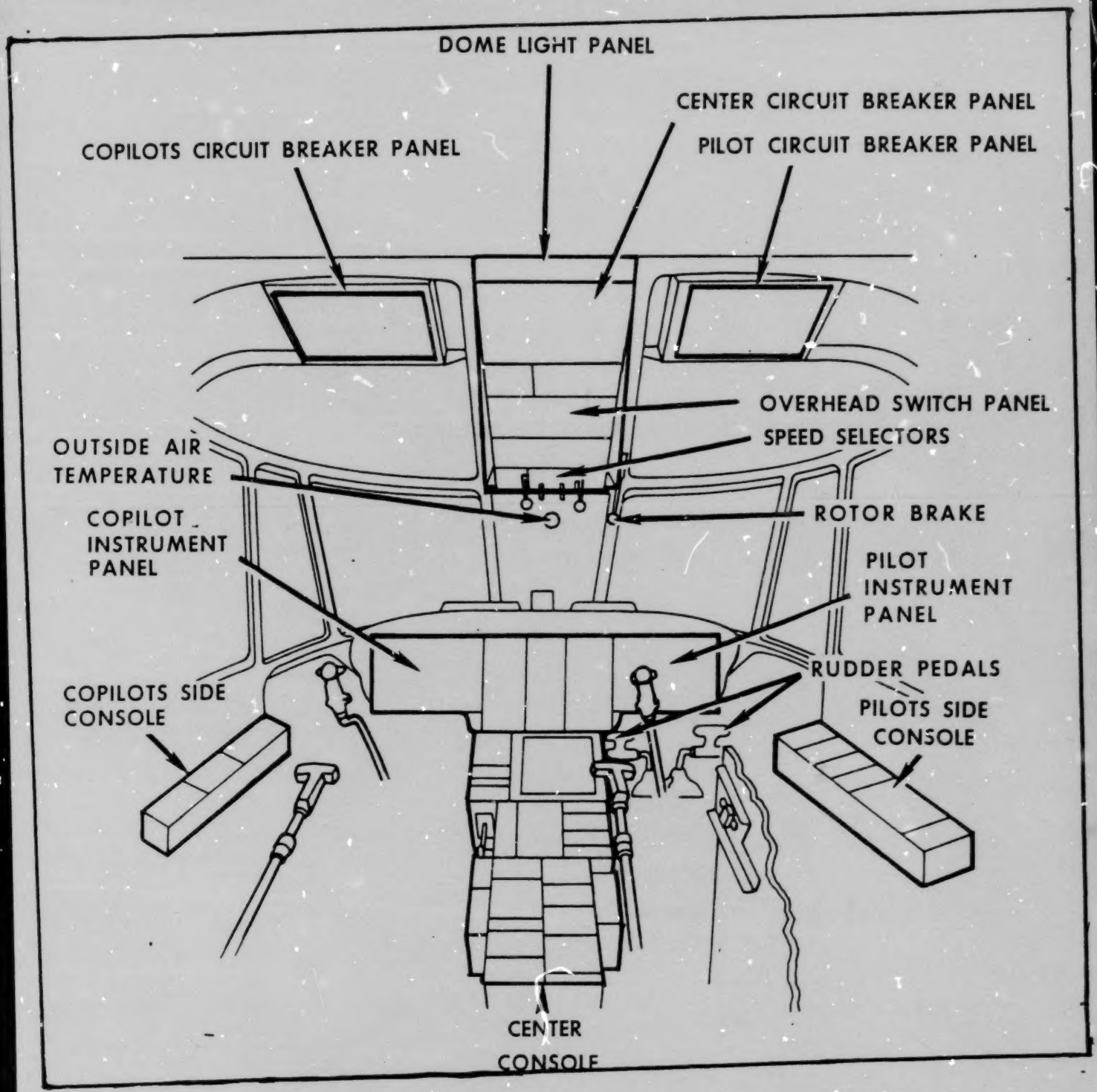

DOME LIGHT PANEL
CENTER CIRCUIT BREAKER PANEL
COPILOTS CIRCUIT BREAKER PANEL
PILOT CIRCUIT BREAKER PANEL
OVERHEAD SWITCH PANEL
SPEED SELECTORS
OUTSIDE AIR TEMPERATURE
ROTOR BRAKE
COPILOT INSTRUMENT PANEL
PILOT INSTRUMENT PANEL
RUDDER PEDALS
COPILOTS SIDE CONSOLE
PILOTS SIDE CONSOLE
CENTER CONSOLE

Figure 1

## HOW TO USE THE LEARNING MATERIALS

### Directions

This lesson will be presented in a way that may be new to you. The following information will help you in completing the lesson quickly and easily.

1. Each item in the NATOPS SH-3 D/H Systems Checklist has been broken down into basic tasks. These tasks are broken down as follows:

a. ACTION: A direct task performed by the pilot. This task may or may not cause the system to do something you can observe.

b. RESPONSE: An indirect task performed as a reaction to a previous action or response. A response item may include a result (e.g.- The pilot is to check an indicator light on after turning on a switch). RESPONSES may follow actions, results, or other responses.

c. RESULT: What the system does as a result of the pilot's actions. RESULT items always follow a preceding action.

d. IF/THEN statements are used when there are alternatives to the ACTION/RESPONSE/RESULT items.

e. In addition, CAUTIONS, WARNINGS, and NOTES are presented where appropriate.

f. Each item in the checklist requires a VOICE RESPONSE when that item is completed.

2. The basic tasks are presented on both INFORMATION pages and PARAPHRASE pages. Information pages contain all the appropriate information for the checklist item. These pages are numbered 1, 2, 3, 4, etc. Certain parts of the information page are underlined. These underlined parts will be blank on the associated paraphrase page, which is numbered 1a, 2a, 3a, 4a, etc. Pages intentionally left blank are not numbered.

a. On the information page, take your time and learn all of the steps of each item correctly and in sequence. The step boxes with directions are numbered. READ THEM IN ORDER and then follow the directions at the bottom of the page.

b. When the information page is complete, and if you are a first tour student in the H-3, then you should turn to the paraphrase page that follows and repeat each step again, mentally filling in the blanks as you go. (DO NOT WRITE IN THIS BOOK.)

c. If you are a second tour student in the H-3, you may wish to skip the paraphrase pages and do only the information pages, but DO ALL ITEMS and FOLLOW ALL DIRECTIONS on those pages.

3. When an item is complete, state (verbalize) the VOICE RESPONSE.

4. Some items of the Systems Checklist are grouped together for review purposes, depending upon the complexity of each item. At the end of the item(s), there is a review for all students. At the top of the page will be the checklist items covered in that section and the response. You should mentally recall the actions, responses or results for each item while referring to the paper mock-up. The bottom of the page contains questions for you to answer. Answer on a separate piece of paper if desired, but DO NOT WRITE IN THIS BOOK.

5. After all information pages have been completed, there is a

finger tracing page for all students to complete. This page gives each item of the checklist but without the VOICE RESPONSE. You should recall the appropriate ACTIONS, RESPONSES, RESULTS and then verbalize the VOICE RESPONSE as you trace the steps on the accompanying drawing.

6. When you have completed the above and can do all the items without hesitation, you have completed this lesson. For best results, follow all of the instructions.

NAVAIR 01-230HLH-1B

SH-3 D/H NATOPS PILOT'S POCKET CHECKLIST

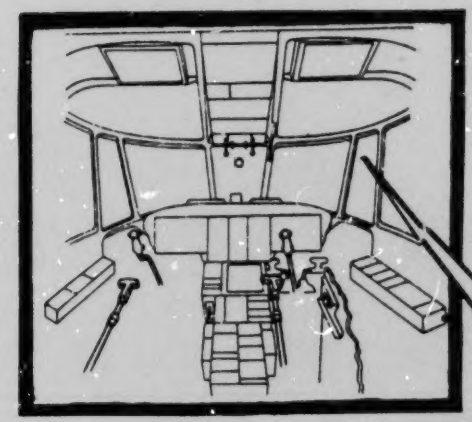
SYSTEMS CHECKLIST

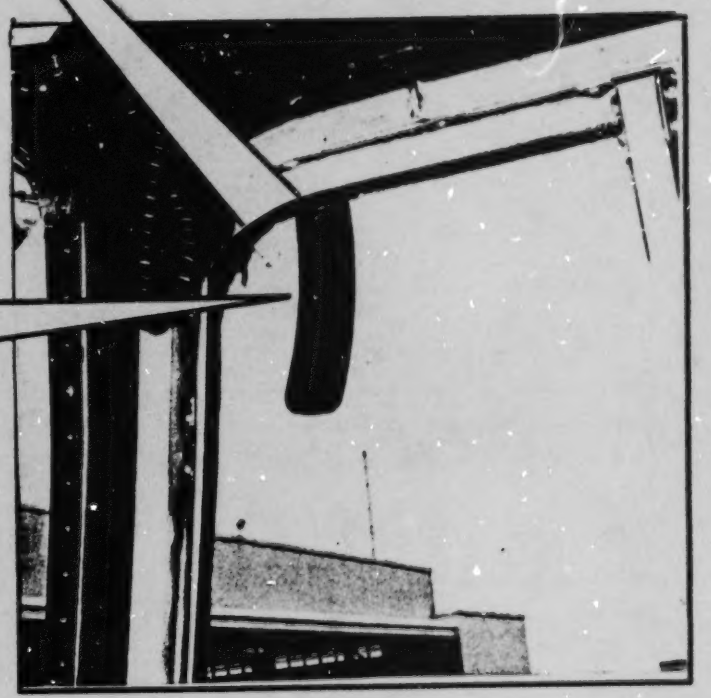
This checklist superseded NAVAIR 01-230HLH-1C dated 1 November 79 and includes change 1 dated 1 April 82.

SYSTEMS CHECKLIST

| | | |
|---|---|---|
| 1. | Area clear | CHECKED |
| 2. | Blades | SPREAD |
| 3. | Hoist and hoist ICS | CHECKED |
| 4. | Flotation gear | [illegible]KED |
| 5. | Head check | AS R[illegible]ED |
| 6. | Rotary wing head | CHECK FOR MOV[illegible]T |
| 7. | Drop tank pumps and indicators (SH-3H) | CHECKED |
| 8. | Servos | CHECKED |
| 9. | Basic ASE | CHECKED |
| 10. | Coupler/doppler checks | AS DESIRED |
| 11. | Navigation equipment check | AS DESIRED |

SYSTEMS CHECKLIST
ITEM 1: Area Clear.....CHECKED
PURPOSE: Prepare area for Item 2.





1. ACTION: Check mirror, look out window to RIGHT.

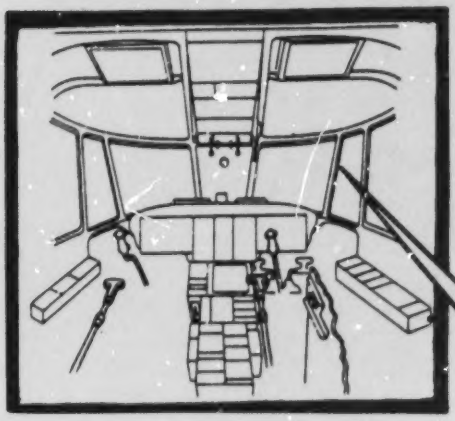
2. ACTION: Look for personnel positioning, yellow gear, or other obstructions.

RESPONSE: Give reply.....
....."CLEAR RIGHT"....

**GO TO PAPER MOCK-UP**

- Practice all items
- Keep practicing until you recall what to do without hesitating

SYSTEMS CHECKLIST
ITEM 1: Area Clear....._____
PURPOSE: Prepare area for Item 2.



1. ACTION: Check _____, look out window to _____.

2. ACTION: Look for _____, _____, _____, or other obstructions.

RESPONSE: Give reply.....
....."____ ____".....

**GO TO PAPER MOCK-UP**

- Practice all items
- Keep practicing until you recall what to do without hesitating

SYSTEMS CHECKLIST
ITEM 2: Blades..... SPREAD
Purpose: Prepare blades for flight.

CAUTION
The primary servo is not normally pressurized when the blades are folded but will pressurize if all electrical power to the helicopter is lost or secured, or if an open circuit develops in the safety valve switch. Primary pressure with the blades folded may damage lockpins

NOTE
Spread/fold power will not be available if the No. 2 engine fuel firewall valve switch is open.

NOTE
The ASE should be OFF during blade spreading to prevent inadvertent control inputs

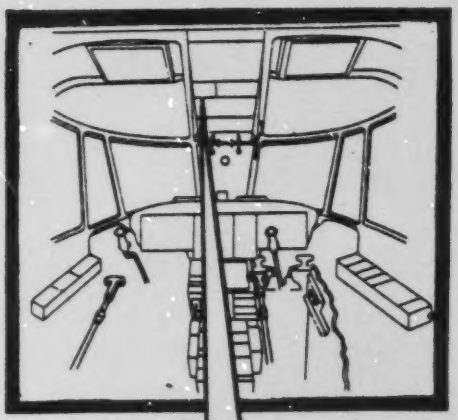
SYSTEMS CHECKLIST
ITEM 2: Blades.....
Purpose: Prepare blades for flight.

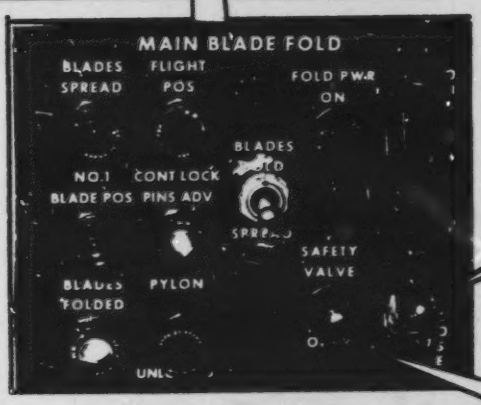
CAUTION
The _____ servo is not normally pressurized when the blades are _____ but will pressurize if all electrical power to the helicopter is lost or secured, or if an open circuit develops in the _____ _____ switch. _____ pressure with the blades _____ may damage lock-pins

NOTE
_____ power will not be available if the No. _ engine fuel firewall valve switch is ___.

NOTE
The ASE should be ___ during blade spreading to prevent inadvertent _____ _____

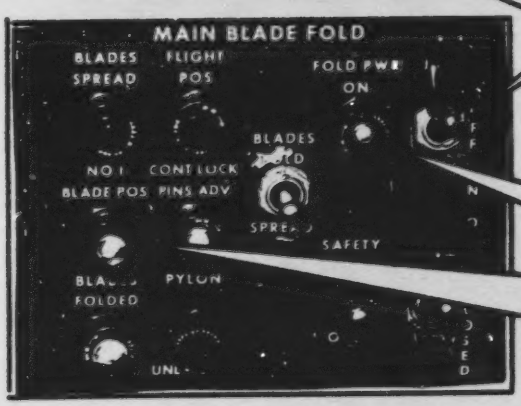
SYSTEMS CHECKLIST
ITEM 2: Blades.....SPREAD






1. ACTION: Safety valve switch..OPEN.

2. RESULT: Safety valve open light..
.....ON....



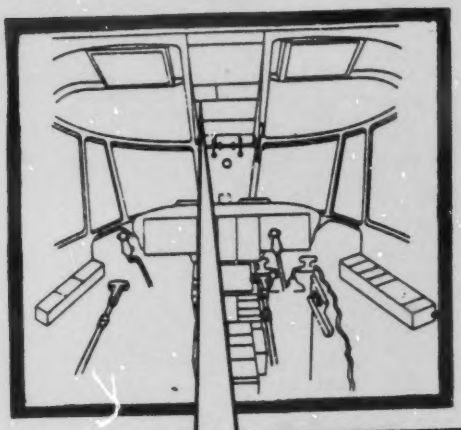

3. ACTION: Blade fold MASTER SWITCH..
.....ON....

4. RESULT: a. Fold power indicator light.....ON.
b. No. 1 blade position light.....ON.

**GO TO PAPER MOCK-UP**

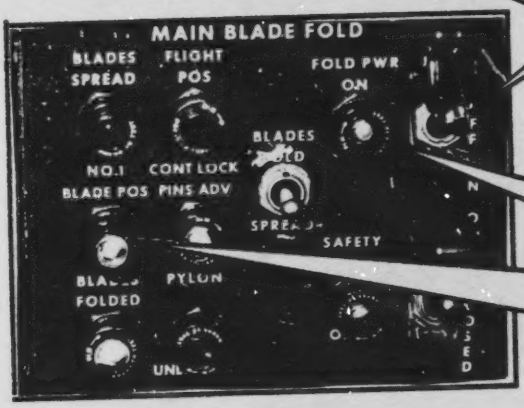
- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 2: Blades....._____



1. ACTION: Safety valve switch..____.

2. RESULT: Safety valve open light..
.....__....



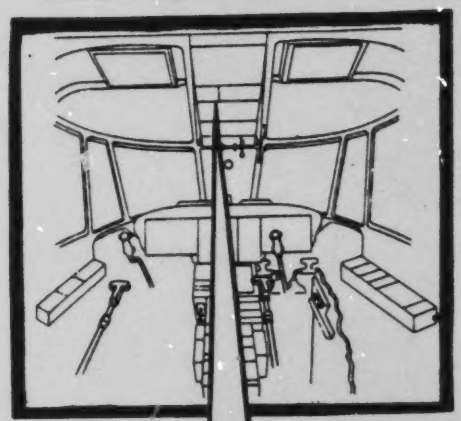

3. ACTION: Blade fold _____ _____..
.....__....

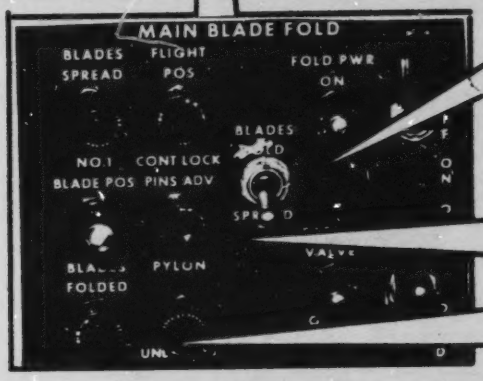
4. RESULT: a. Fold power indicator light.....__.
b. No. 1 blade position light.....__.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 2: Blades.....SPREAD






5. ACTION: Blades fold-spread switch.....SPREAD.

6. RESULT: a. Blades folded light...OFF, when first blade moves. b. Control lock-pins advance light.....OFF, when lockpins are disengaged.

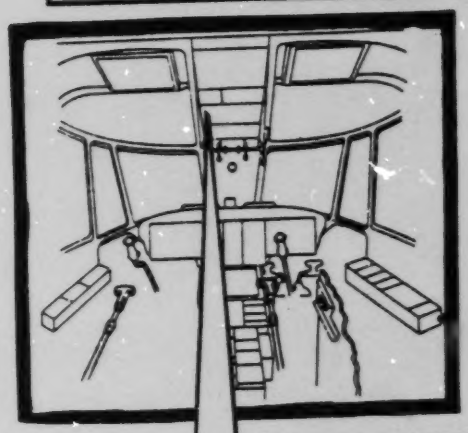
7. RESPONSE: Check the mirror and also watch the Plane Captain to determine if the blades are spreading.

8. RESPONSE: When the Plane Captain gives the blades spread signal, then check the BLADES SPREAD light.....ON.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 2: Blades....._____



5. ACTION: Blades fold-spread switch.....
....._____.

6. RESULT: a. Blades folded light...___, when _____ blade moves. b. Control lock-pins advance light.....___, when lockpins are _____.

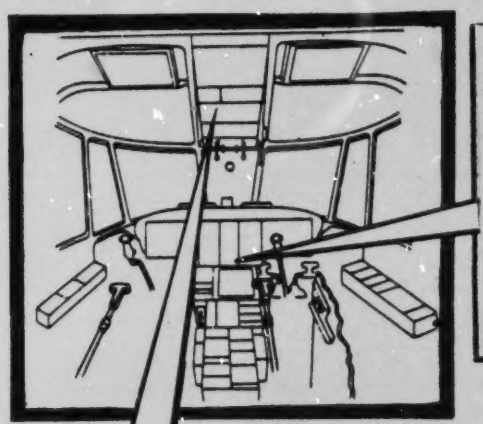
7. RESPONSE: Check the _____ and also watch the Plane Captain to determine if the blades are _____.

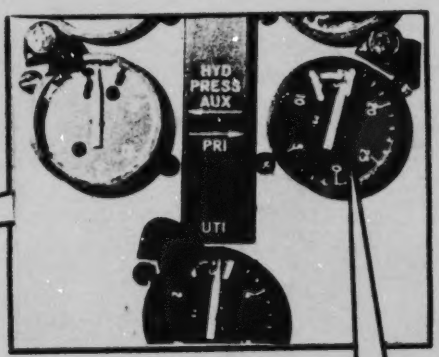
8. RESPONSE: When the Plane Captain gives the _____ _____ signal, then check the _____ light.....__.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 2: Blades.....SPREAD






12. RESULT: Primary servo hydraulic pressure.....1500 PSI.

11. RESULT: Fold power indicator light.....OFF.

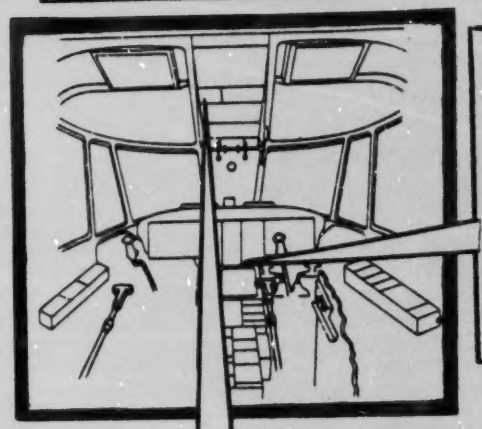
10. RESULT: Safety valve warning light.....OFF.

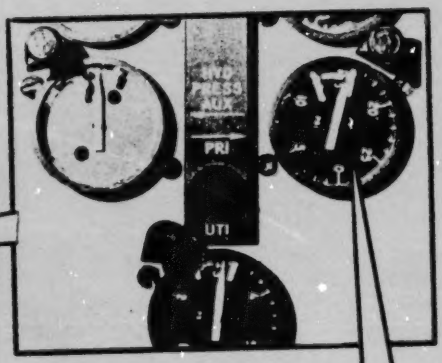
9. ACTION: Safety valve switch.....CLOSE.

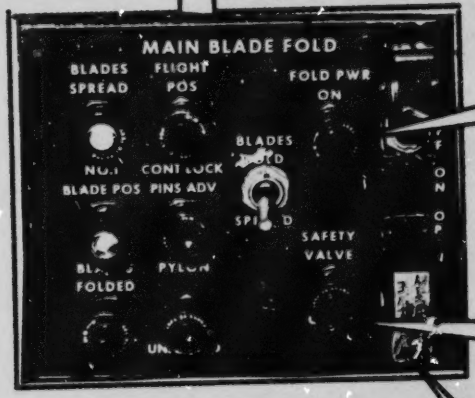
**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 2: Blades....._____






12. RESULT: _____ servo hydraulic pressure.....___ PSI.

11. RESULT: ___ ____ indicator light.....__.

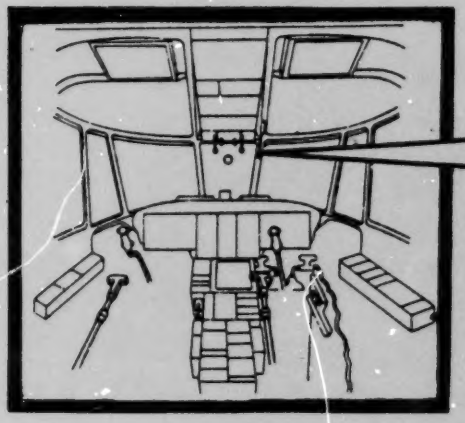
10. RESULT: Safety valve _____ ____.....__.

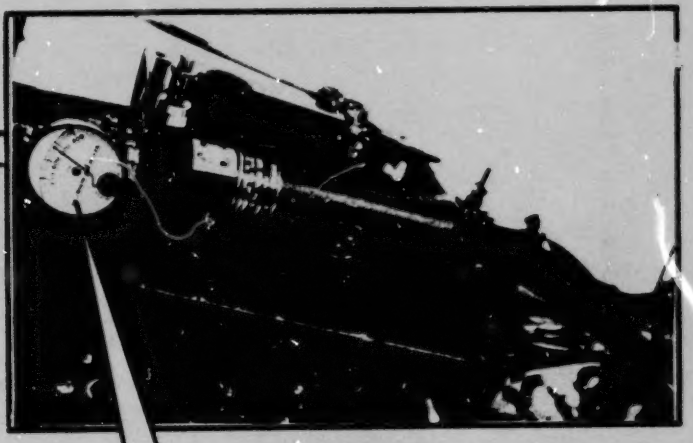
9. ACTION: Safety valve switch..... .....____.

**GO TO PAPER MOCK-UP**

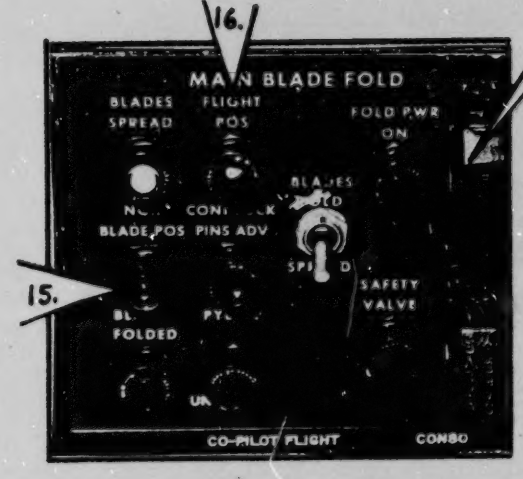
- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 2: Blades.....SPREAD





13. ACTION: Check rotor brake.....320 psi minimum.




14. ACTION: Blade fold master switch.....OFF.

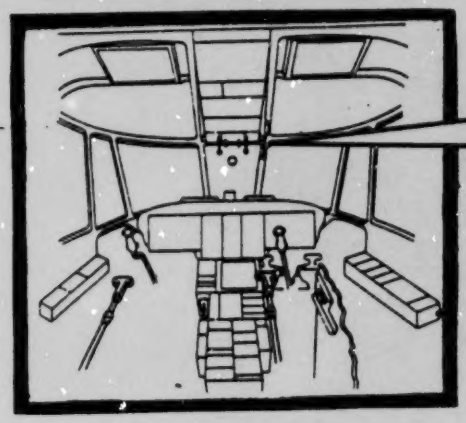
15. RESULT: No. 1 blade position light.....OFF.

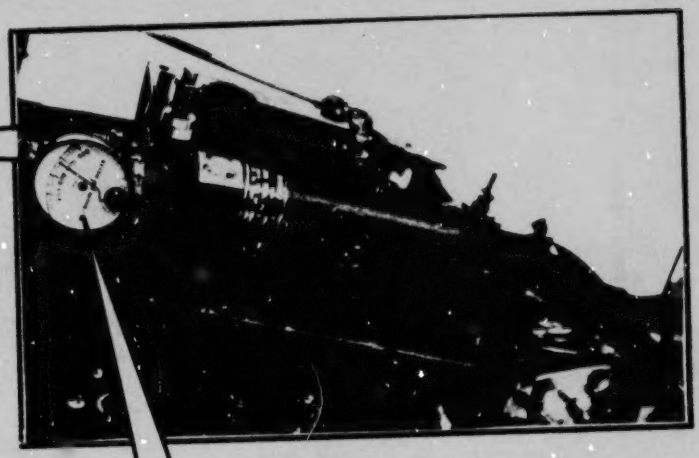
16. RESULT: Flight position light.....ON.

**GO TO PAPER MOCX-UP**

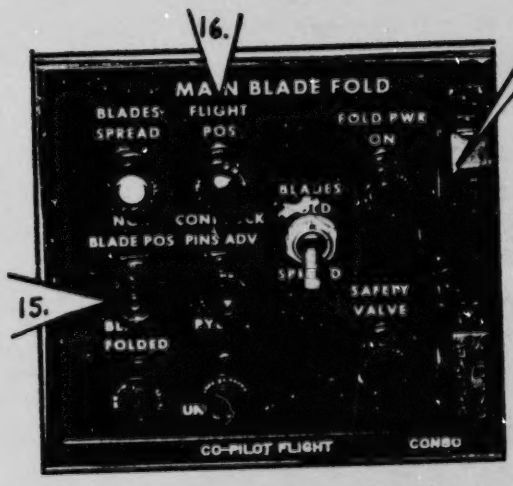
- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 2: Blades....._____





13. ACTION: Check rotor brake.....___ psi minimum.




14. ACTION: Blade fold master switch.....___.

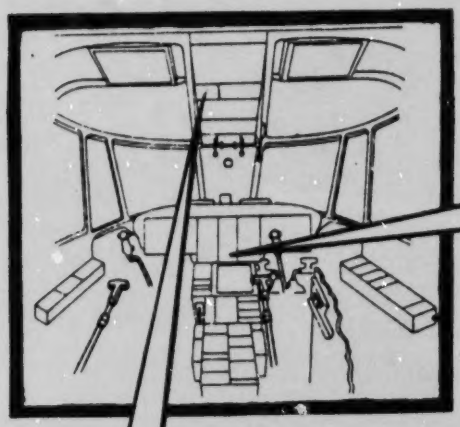
15. RESULT: No. 1 blade position light.....___.

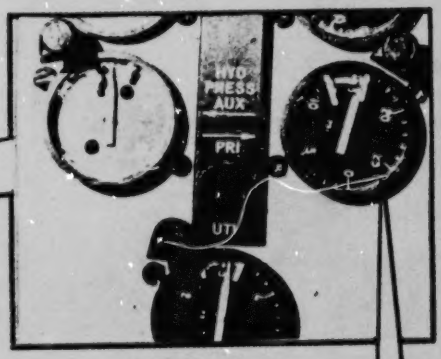
16. RESULT: _____ position light.....__.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

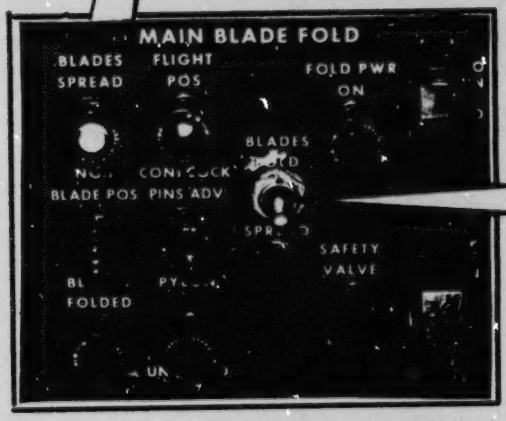
SYSTEMS CHECKLIST
ITEM 2: Blades.....SPREAD






19. RESPONSE: Give reply....."SPREAD"

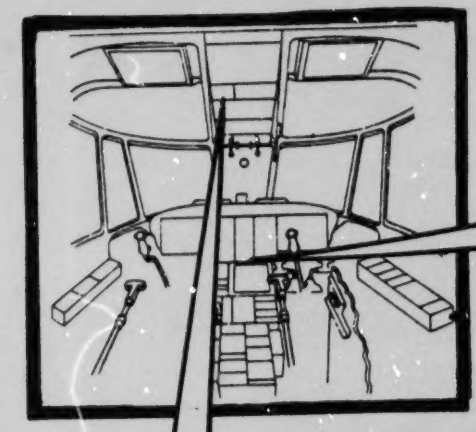
18. RESPONSE: Check blades spread and flight position lights ON. Check primary servo hydraulic pressure at 1500 PSI.

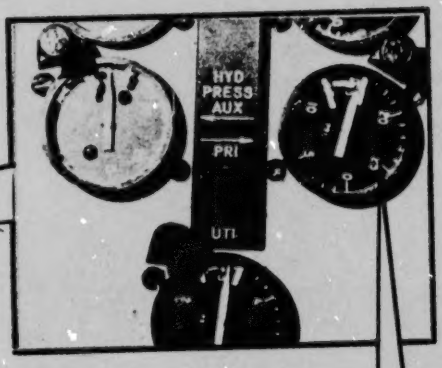



17. ACTION: Blade fold-spread switch .....OFF.

CAUTION
Check with ground crewman to be sure that blades are in proper spread position and that the blade lockpins are securing the blades in place.

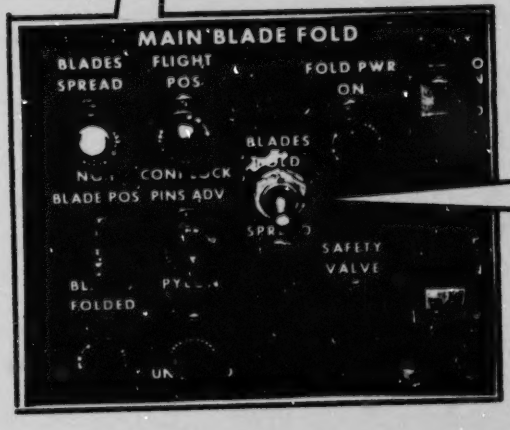
SYSTEMS CHECKLIST
ITEM 2: Blades....._____






19. RESPONSE: Give reply....."_____"

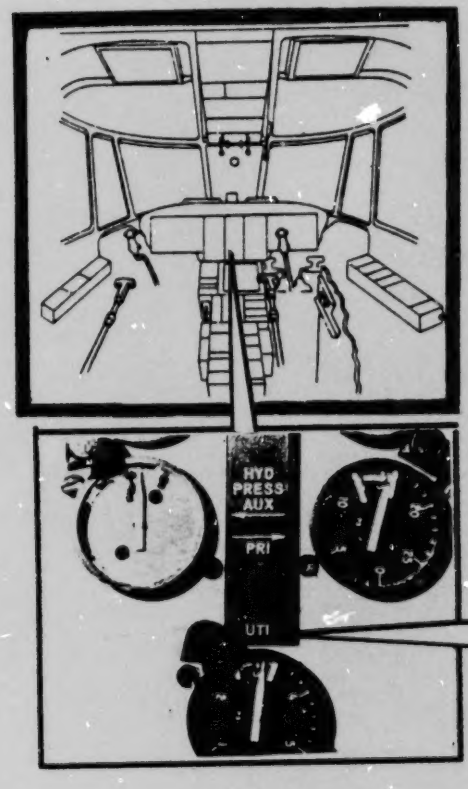
18. RESPONSE: Check _____ _____ and _____ _____ lights __. Check _____ servo hydraulic pressure at ____ PSI.




17. ACTION: Blade fold-spread switch .....___.

CAUTION
Check with ground crewman to be sure that blades are in proper spread position and that the blade lockpins are securing the blades in place

SYSTEMS CHECKLIST
ITEM 3: Hoist and hoist ICS.....CHECKED
Purpose: Check hoist operation and ICS system.




1. ACTION: Contact crewman via ICS.

NOTE
Utility hydraulic pressure will fluctuate whenever the hoist is lowered or raised. The crewman may have done this check prior to this point in the checklist.

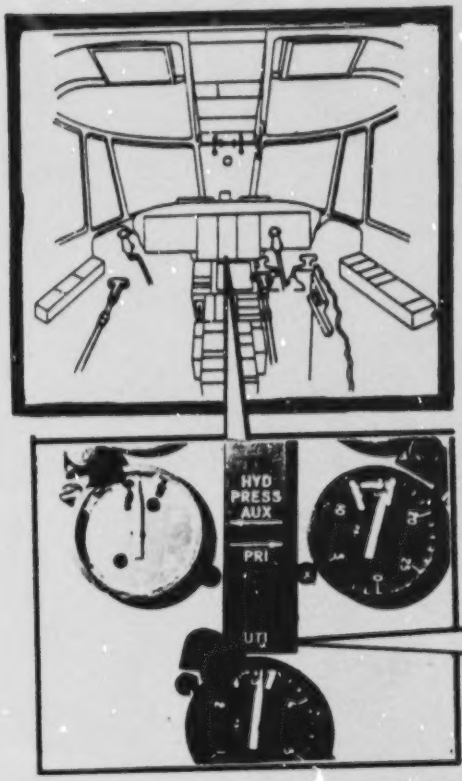
2. RESPONSE: Crewman reports status of the hoist, number and types of smokes aboard, number of matrix lights, and status of the SAR gear.

3. ACTION: Pilot "Rogers" crewman's report

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 3: Hoist and hoist ICS....._____
Purpose: Check hoist operation and ICS system.




1. ACTION: Contact crewman via ICS.

NOTE
Utility hydraulic pressure will _____ whenever the hoist is lowered or raised. The crewman may have done this check prior to this point in the checklist.

2. RESPONSE: Crewman reports status of the _____, number and types of _____ aboard, number of _____ lights, and status of the ___ ___.

3. ACTION: Pilot "Rogers" crewman's report

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
REVIEW: ITEMS 1, 2, and 3.

**GO TO PAPER MOCK-UP**

- Practice all items
- Keep practicing until you recall what to do without hesitating

Item 1: Area clear.....CHECKED
Item 2: Blades.....SPREAD
Item 3: Hoist and hoist ICS.....CHECKED

Review Questions:

1. Name two places you should look to check the area clear.

2. List all items you can think of that you are looking for in checking the area clear.

3. What can happen to the head if the No. 1 engine is running, the blades are folded, and all electrical power is lost?

4. Do the fuel firewall valve switches have anything to do with the spread/fold cycle? What?

5. ASE should be off or on during the spread cycle? Why?

6. List the sequence in which the blade fold/spread panel indicator lights go on or off.

7. What signal do you give the plane captain to signal "spreading the blades"? What signal does he give you to signal blade movement and "blades spread"?

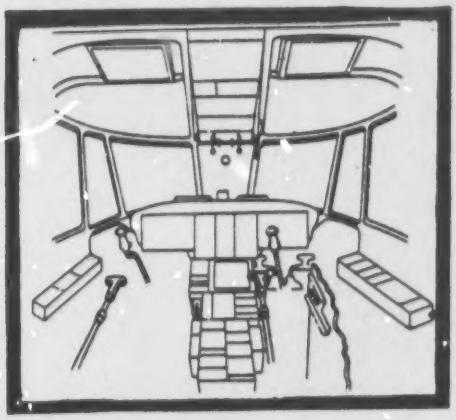
8. When does primary hydraulic pressure go to a normal reading on the gauge during the spread cycle?

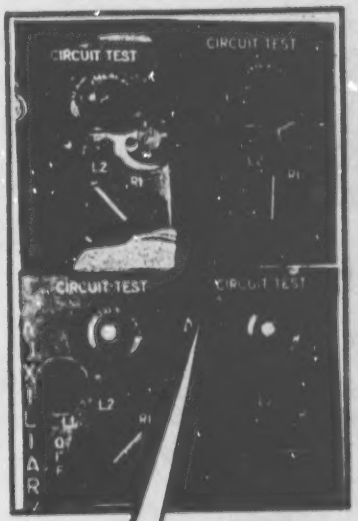
9. Name the two indicator lights that should be on when the blades are spread and No. 1 engine is in accessory drive.

10. How can you tell if the rescue hook is being lowered and raised by the crewman? Name two ways.

11. Besides the hoist status, what other items should the crewman report to you?

SYSTEMS CHECKLIST
ITEM 4: Flotation gear..... CHECKED
Purpose: Check continuity of circuits.

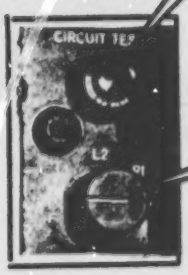




1. ACTION: Check arming switch...OFF.

2. ACTION: Turn rotary selector test switch to each position L1, L2, R1, R2.

3. RESPONSE: Check indicating light ON in each position.

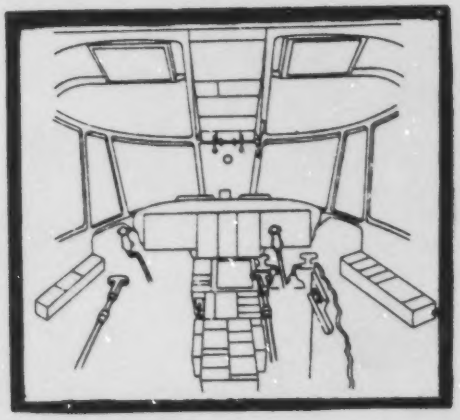


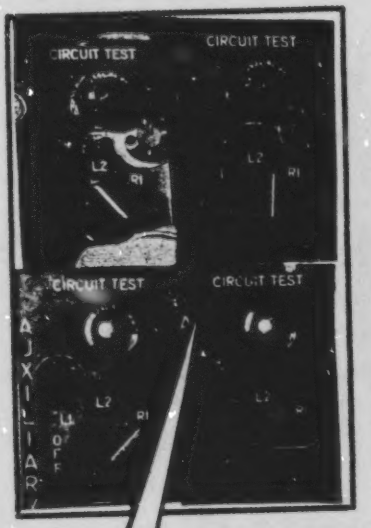

4. ACTION: Turn rotary selector test switch.....OFF.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 4: Flotation gear.....
Purpose: Check continuity of circuits.

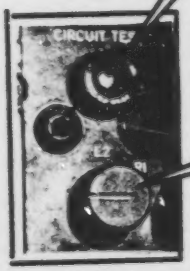




1. ACTION: Check arming switch...___.

2. ACTION: Turn _____ _____ _____ switch to each position __, __, __, __.

3. RESPONSE: Check _____ _____ ON in each position.

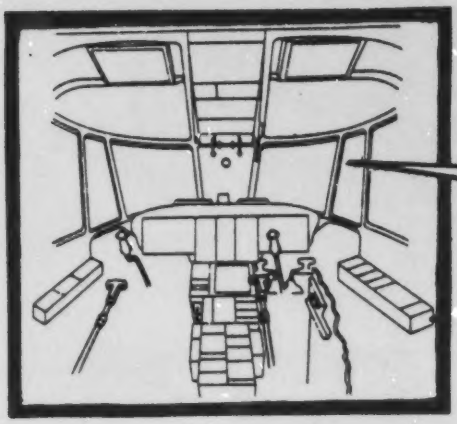



4. ACTION: Turn rotary selector test switch.....___.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 5: Head check..... AS REQUIRED
Purpose: Check lockpin position, dampeners, flap restraints, leaks.



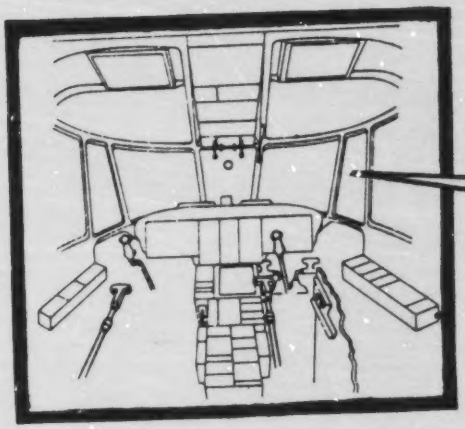
1. ACTION: Give head check signal to Plane Captain.

2. RESPONSE: Plane Captain signals checker to climb up to head.

3. ACTION: Watch checker in mirror and Plane Captain for signal, "Rotor Brake OFF".

4. RESPONSE: Rotor brake "OFF", on signal.

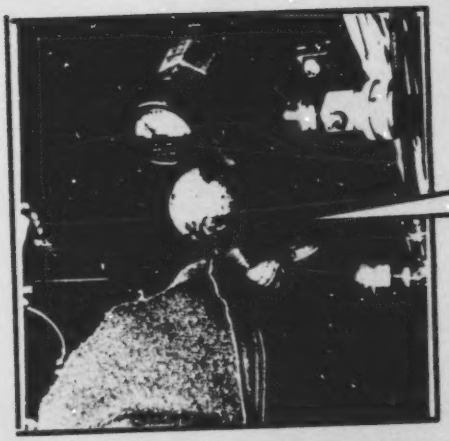
SYSTEMS CHECKLIST
ITEM 5: Head check.....
Purpose: Check lockpin position, dampeners, flap restraints, leaks.



1. ACTION: Give head check signal to _____.

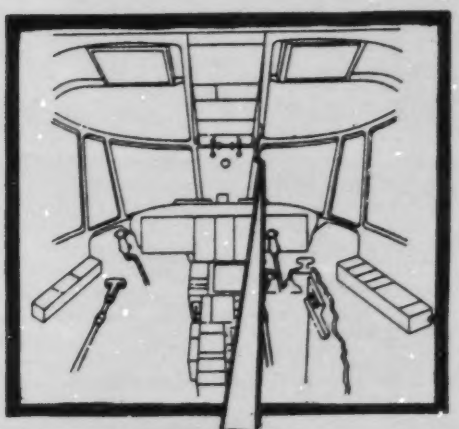
2. RESPONSE: Plane Captain signals _____ to _____ to head.

3. ACTION: Watch _____ in mirror and Plane Captain for signal, "_____".



4. RESPONSE: Rotor brake "___", on signal.

SYSTEMS CHECKLIST
ITEM 5: Head check..... AS REQUIRED



5. ACTION: Watch for signal "Rotor brake ON".

6. RESPONSE: Put rotor brake ON.

7. ACTION: Watch Plane Captain for signal to cycle collective and cyclic.

8. RESPONSE: Cycle controls while checker checks for response and leaks of the primary servos.

WARNING

Personal injury may occur if controls are moved without knowledge of the man on the rotor head.

9. ACTION: Watch for thumbs up from Plane Captain.

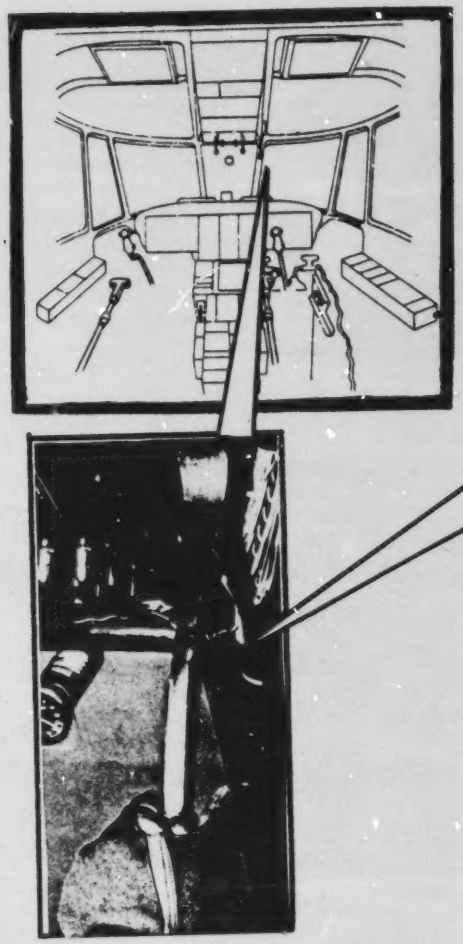
10. RESPONSE: Stop cycling controls and check mirror to ensure head clear and transmission access door secure.

11. RESPONSE: Give reply...."CHECKED"

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 5: Head check....._____



5. ACTION: Watch for signal "Rotor brake __".

6. RESPONSE: Put rotor brake __.

7. ACTION: Watch Plane Captain for signal to cycle _____ and _____.

8. RESPONSE: Cycle _____ while checker checks for response and _____ of the _____ servos.

WARNING

Personal injury may occur if controls are moved without knowledge of the man on the rotor head.

9. ACTION: Watch for _____ __ from Plane Captain.

10. RESPONSE: Stop cycling controls and check _____ to ensure ____ clear and _____ _____ door secure.

11. RESPONSE: Give reply...."_____"

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 6: Rotary wing head..... CHECK FOR MOVEMENT
Purpose: Ensure the rotor brake is not dragging.

5. RESPONSE: Give reply..."FREE"

4. ACTION: Put rotor brake ON.

3. ACTION: If rotary wing moves slowly, or not at all, then move cyclic forward and to the left and slowly pump the collective.

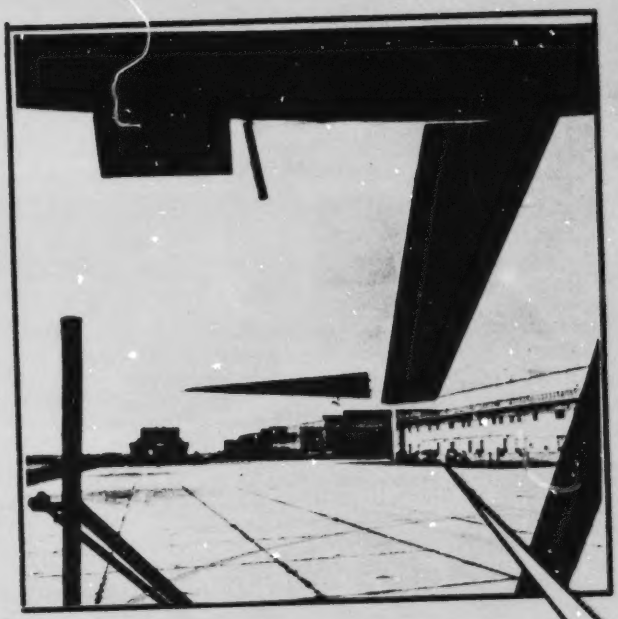
2. RESPONSE: Watch for 1/8 revolution of rotary wing.

1. ACTION: Check head area clear release rotor brake.

**GO TO PAPER MOCK-UP**

- Practice all items
- Keep practicing until you recall what to do without hesitating

SYSTEMS CHECKLIST
ITEM 6: Rotary wing head.....____ __ _____
Purpose: Ensure the rotor brake is not dragging.



5. RESPONSE: Give reply..."____"

4. ACTION: Put rotor orake __.

3. ACTION: If rotary wing moves slowly, or not at all, then move cyclic _____ and to the ____ and slowly pump the _____.

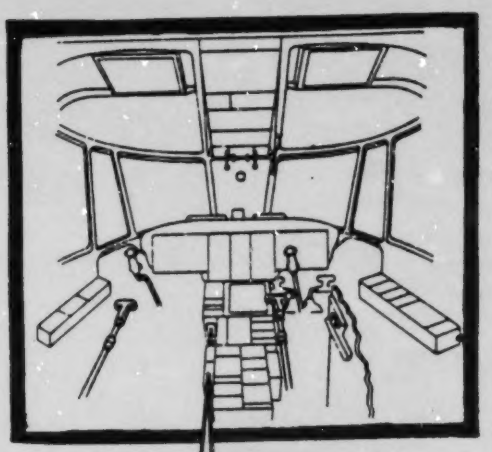
2. RESPONSE: Watch for ___ revolution of rotary wing.

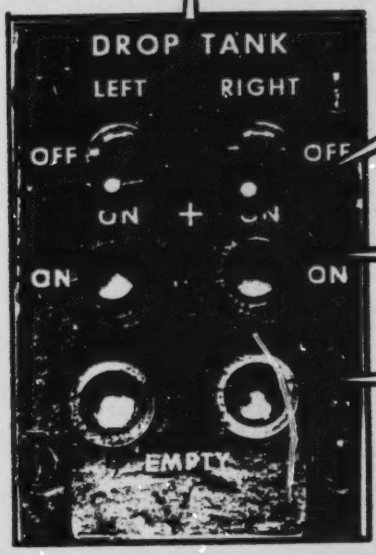
1. ACTION: Check ____ area clear release _____ _____.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 7: Drop tanks, pumps, and indicators (SH-3H)..... CHECKED
Purpose: Check system operation.






1. ACTION: Turn pump switches on.

2. RESPONSE: If tanks are installed, check green lights on, push-to-test red lights.

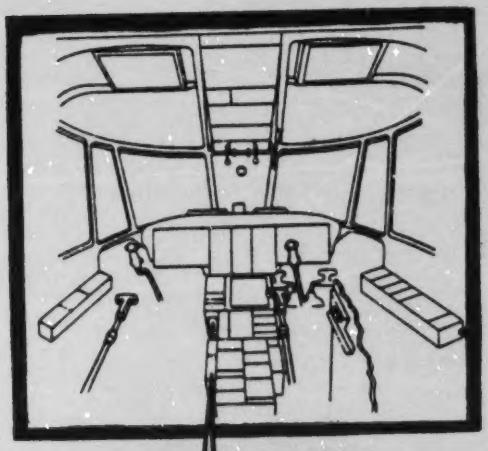
3. RESPONSE: If tanks are NOT installed, check red lights on, push-to-test green lights.

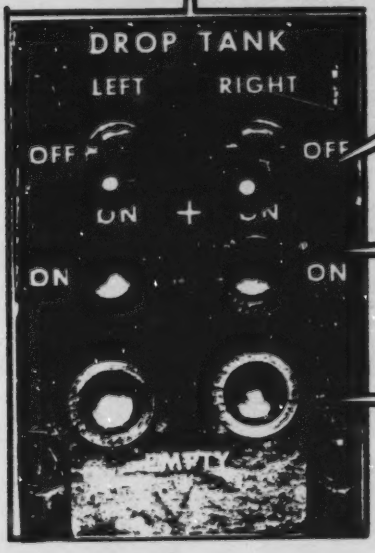
4. ACTION: Turn pump switches OFF.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 7: Drop tanks, pumps, and indicators (SH-3H)....._____
Purpose: Check system operation.






1. ACTION: Turn ___ _____ on.

2. RESPONSE: If tanks are _____, check _____ lights __, push-to-test ___ lights.

3. RESPONSE: If tanks are NOT installed, check ___ lights __, push-to-test _____ lights.

4. ACTION: Turn pump switches ___.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
REVIEW: ITEMS 4, 5, 6, AND 7.

**GO TO PAPER MOCK-UP**

- Practice all items
- Keep practicing until you recall what to do without hesitating

Item 4: Flotation gear.....CHECKED
Item 5: Head check.....AS REQUIRED
Item 6: Rotary wing head.....CHECK FOR MOVEMENT
Item 7: Drop tanks, pumps, and indicators (SH-3H).....CHECKED

Review Questions:

1. List the steps to test the flotation gear circuits.

2. List the steps to actually inflate the flotation gear.

3. What signal do you give to the plane captain to check the head?

4. What signal should you be watching for from the plane captain to take the "Rotor brake OFF"?....."Rotor brake ON"?

5. When you cycle the controls (name which ones), what is the head checker looking at and for what purpose?

6. What is the purpose of checking the rotary wing head for movement?

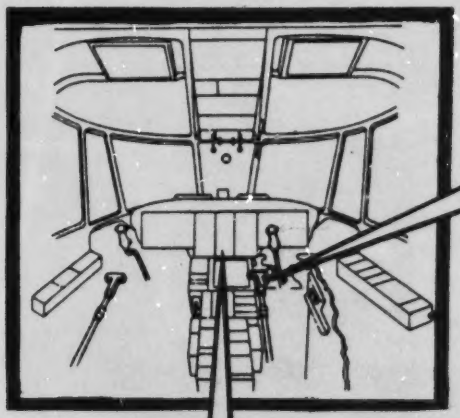
7. How much should the head move?

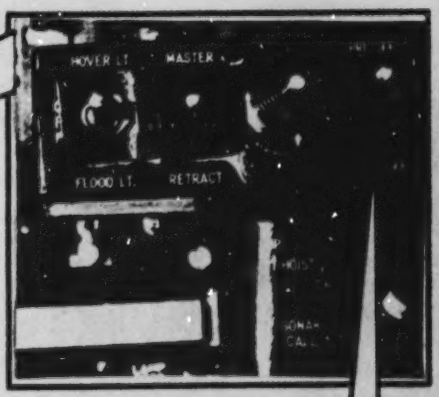
8. Name which models of the SH-3 do not have drop tanks.

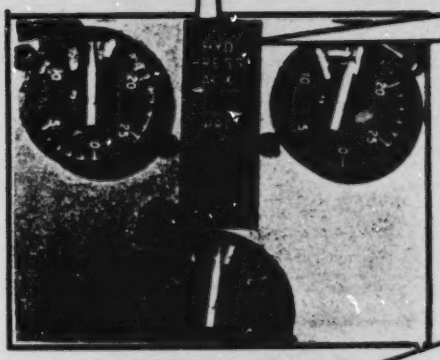
9. If drop tanks are installed and full, which color indicator lights will come on when the switches are turned on.

10. If the drop tanks are not installed or are not full, which color indicator lights will come on when the pump switches are turned on.

SYSTEMS CHECKLIST
ITEM 8: Servos..... CHECKED
Purpose: Check servo action and freedom of controls.



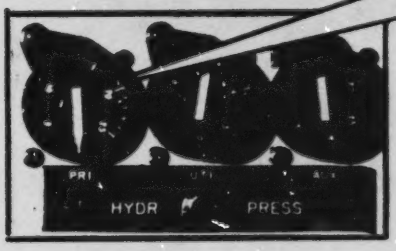


1. ACTION: Check AUX and PRI servo hydraulic pressure indicators in NORMAL RANGE.

2. ACTION: Turn "flight control servo switch" to PRI OFF.

3. RESULT: PRI pressure drops to ZERO.




4. RESULT: CAUTION light goes ON.

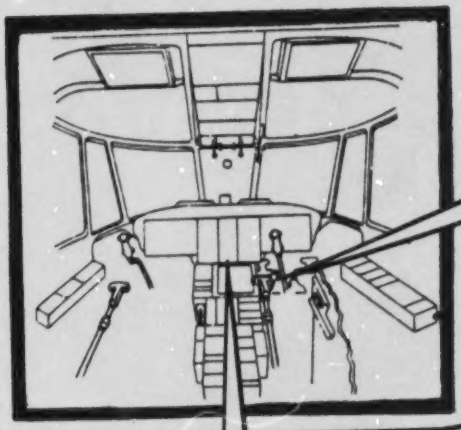
NOTE

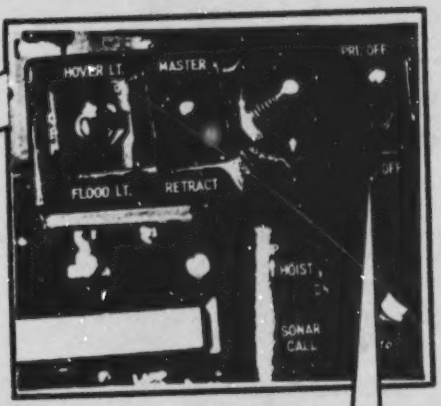
The two types of gage arrangements shown above are both found in the SH-3H.

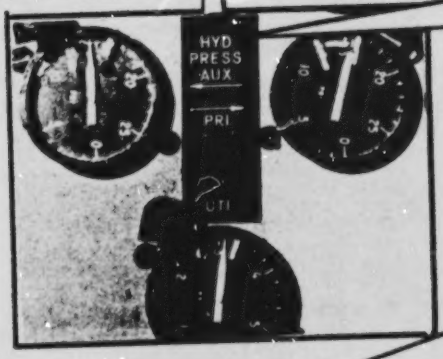
**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 8: Servos.....
Purpose: Check servo action and freedom of controls.



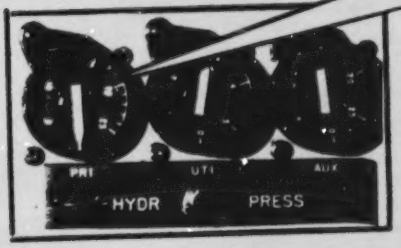



1. ACTION: Check AUX and PRI servo hydraulic pressure indicators in _____ _____.

2. ACTION: Turn "flight control servo switch" to ___ ___.

3. RESULT: ___ pressure drops to ____.




4. RESULT: _____ light goes __.

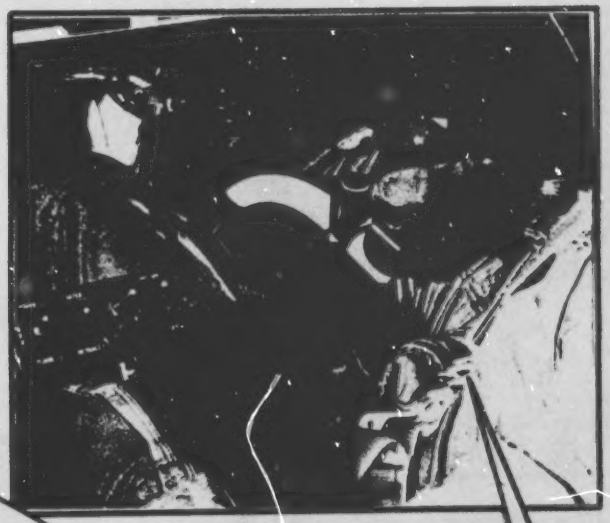
NOTE

The two types of gage arrangements shown above are both found in the SH-3H.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 8: Servos..... CHECKED



5. ACTION: Depress trim release button.

6. ACTION: Raise collective fully up.

7. ACTION: Move cyclic full forward to aft, then left to right

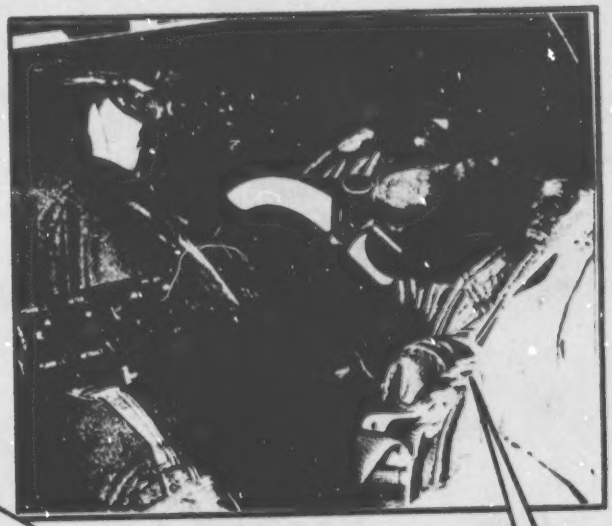
8. RESULT: Cyclic should move freely in all directions.

9. ACTION: Repeat parts 5, 6, 7, and 8 with the collective full down.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 8: Servos....._____



5. ACTION: Depress ___ _____ button.

6. ACTION: Raise _____ fully up.

7. ACTION: Move cyclic full _____ to __, then ___ to ____

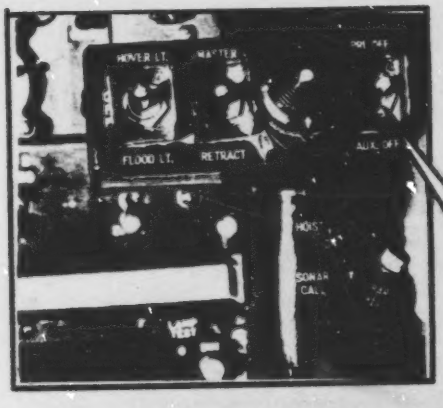
8. RESULT: Cyclic should ____ _____ in all directions.

9. ACTION: Repeat parts 5, 6, 7, and 8 with the collective ____ ___.

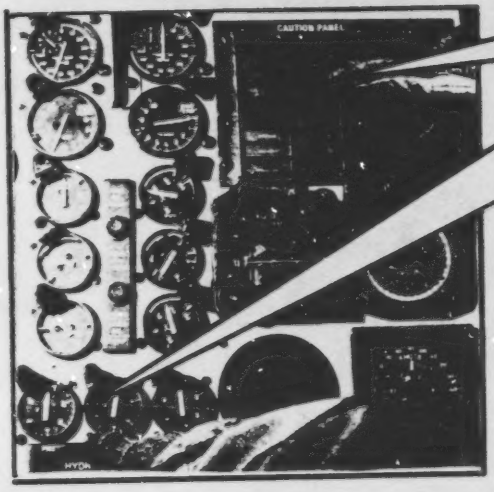
**GO TO PAPER MOCK-UP**

- Practice all items
- Keep practicing until you recall what to do without hesitating

SYSTEMS CHECKLIST
ITEM 8: Servos..... CHECKED




10. ACTION: Turn flight control servo switch to ON.

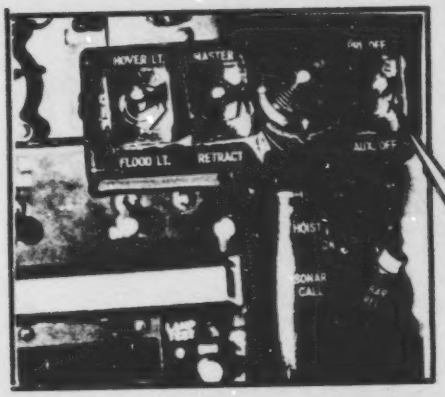



11. RESULT: Caution light goes out and PRI pressure returns to normal.

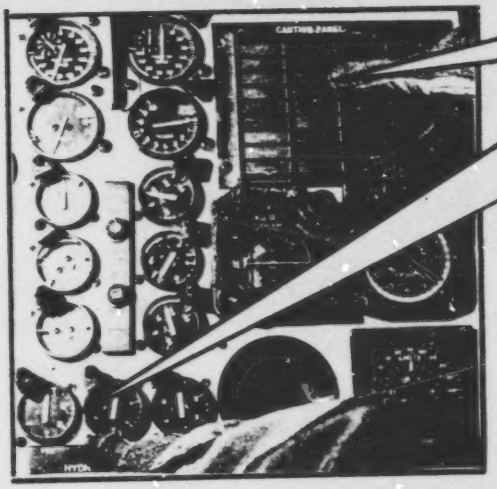
**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 8: Servos....._____




10. ACTION: Turn flight control servo switch to __.

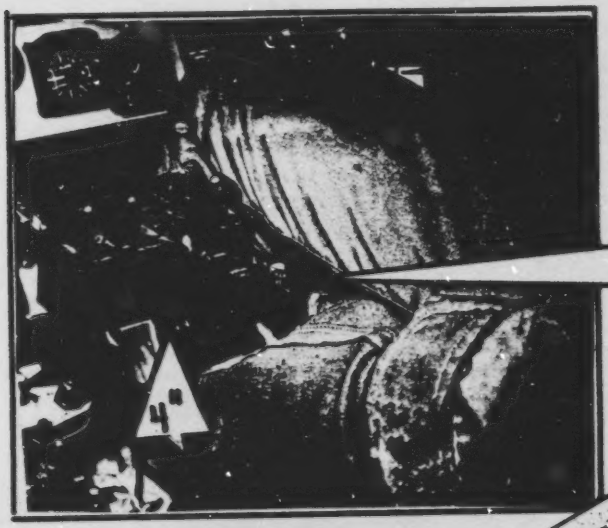


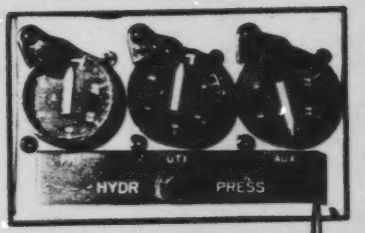
11. RESULT: Caution light goes ___ and ___ pressure returns to normal.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 8: Servos..... CHECKED

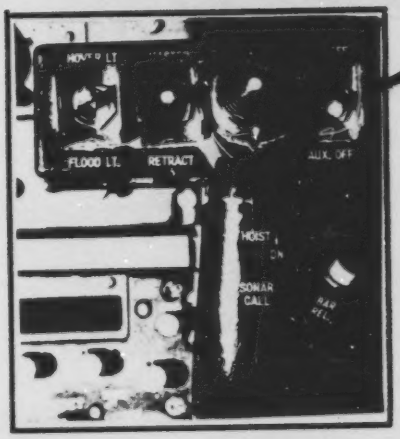



12. ACTION: Raise collective to a mid-position (about 4" up).

13. ACTION: Switch flight control servo switch to AUX OFF.

14. RESULT: AUX pressure falls to zero and the caution light goes ON.

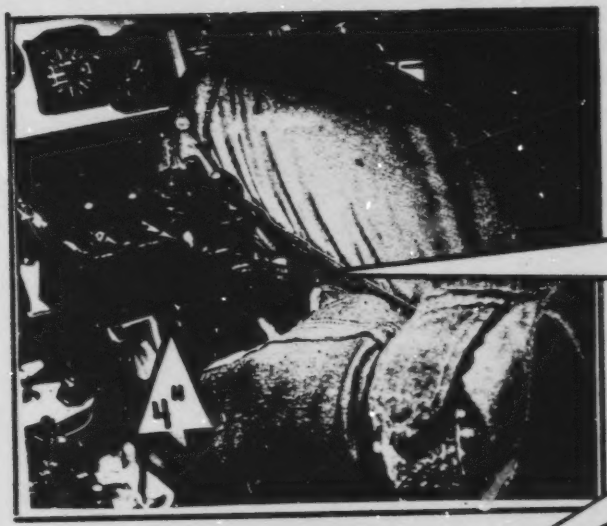


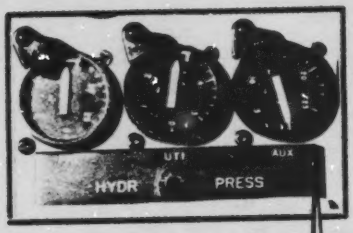

15. RESPONSE: Check maximum cyclic jump is no more than 1/8 inch, collective and rudder pedal jump no more than 1/16 inch. If reaction is excessive, wait 12 to 15 minutes for system to warm up and then repeat checks.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 8: Servos.....

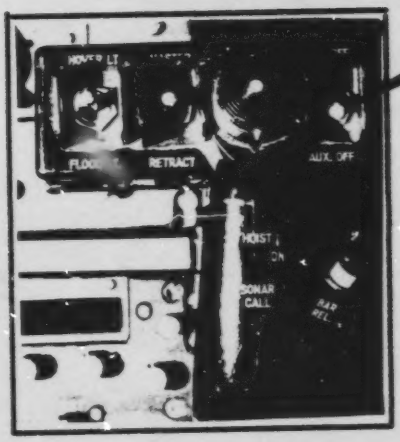



12. ACTION: Raise _____ to a mid-position (about _" up).

13. ACTION: Switch flight control servo switch to ___ ___.

14. RESULT: AUX pressure falls to ___ and the caution light goes __.




15. RESPONSE: Check maximum _____ jump is no more than ___ inch, _____ and _____ jump no more than ___ inch. If reaction is excessive, wait __ to __ minutes for system to warm up and then repeat checks.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 8: Servos.....CHECKED

16. ACTION: Depress trim release button.

17. ACTION: Actuate collective full up and cyclic to extreme forward to aft, and left to right.

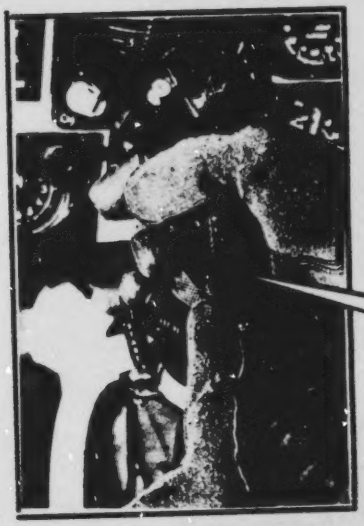
18. RESPONSE: Check cyclic for freedom of movement.

19. ACTION: Repeat parts 16, 17, and 18 with collective full down.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 8: Servos....._____



16. ACTION: Depress ____ release button.

17. ACTION: Actuate collective ____ __ and cyclic to extreme _____ to ___, and ____ to ____.

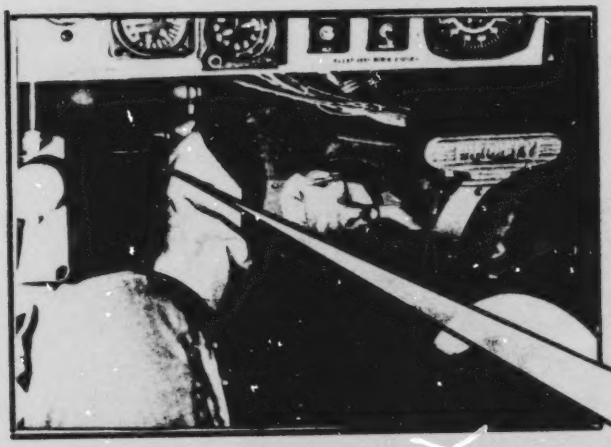
18. RESPONSE: Check cyclic for _____ __ _____.

19. ACTION: Repeat parts 16, 17, and 18 with collective ____ ____.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 8: Servos..... CHECKED



20. ACTION: While collective is full down, fully depress left rudder pedal, then raise collective completely.

21. RESULT: Rudder pedal should move aft approximately 2 inches.

22. ACTION: While collective is full up, fully depress right rudder pedal, then lower collective completely.

23. RESULT: Rudder pedal should move aft approximately 2 inches.

**GO TO PAPER MOCK-UP**

- Practice all items
- Keep practicing until you recall what to do without hesitating

SYSTEMS CHECKLIST
ITEM 8: Servos.....

20. ACTION: While collective is _____, fully depress ____ rudder pedal, then _____ collective completely.

21. RESULT: Rudder pedal should move ___ approximately _ inches.

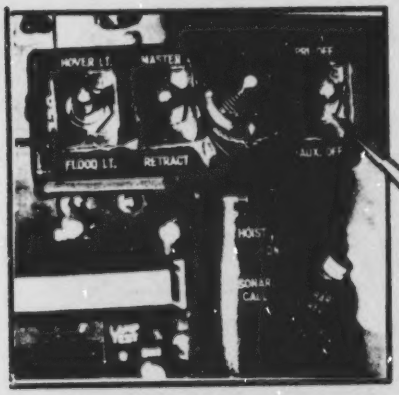
22. ACTION: While collective is _____, fully depress _____ rudder pedal, then _____ collective completely.

23. RESULT: Rudder pedal should move ___ approximately _ inches.

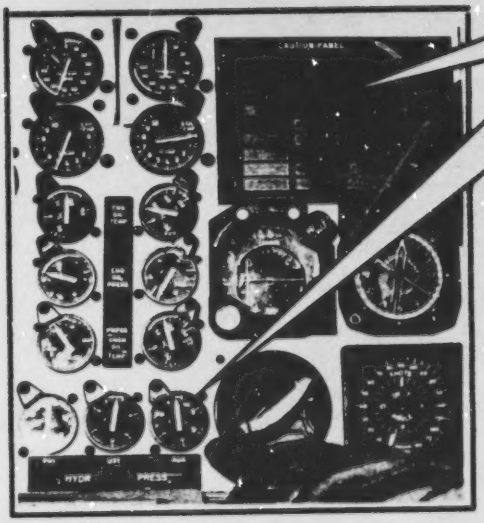
**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 8: Servos.....CHECKED




24. ACTION: Switch flight control servo switch.....ON.



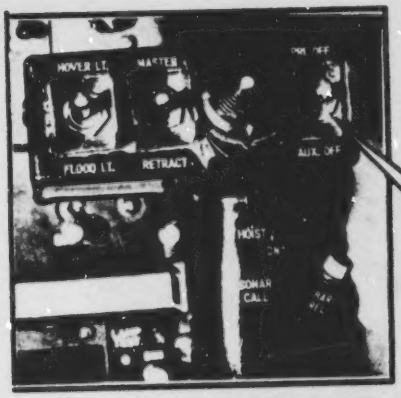
25. RESPONSE: Check all servo pressures reading normal and servo caution lights out.

26. RESPONSE: Give reply.....
......"CHECKED"

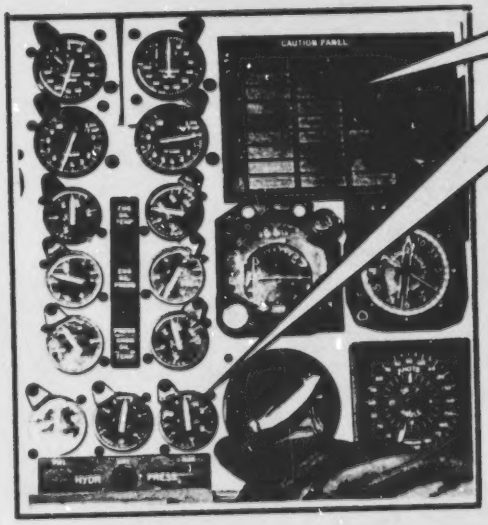
**GO TO PAPER MOCK-UP**

- Practice all items
- Keep practicing until you recall what to do without hesitating

SYSTEMS CHECKLIST
ITEM 8: Servos....._____




24. ACTION: Switch flight control servo switch.....__.




25. RESPONSE: Check all servo pressures reading _____ and servo caution lights ___.

26. RESPONSE: Give reply.....
....."_____"

**GO TO PAPER MOCK-UP**

- Practice all items
- Keep practicing until you recall what to do without hesitating

SYSTEMS CHECKLIST
REVIEW: ITEM 8

**GO TO PAPER MOCK-UP**

- Practice all items
- Keep practicing until you recall what to do without hesitating

Item 8: Servos.....CHECKED

Review Questions:

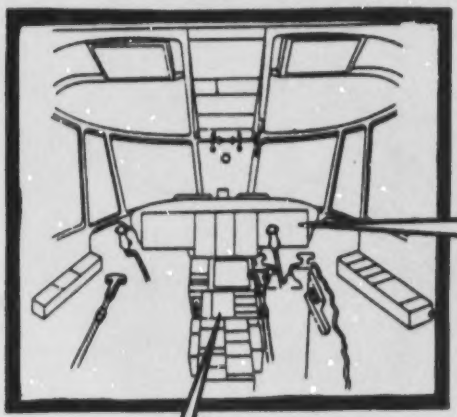
1. What is the normal pressure range of the PRI and AUX hydraulic systems?
2. T or F. The trim release button should be depressed to check the PRI system but not the AUX.
3. The first check of each system is with the collective up or down?
4. Before securing the AUX system, where should the collective be?
5. When the AUX system is secured, give the maximum allowable jump for each control.
6. If the jump is excessive what should you do?
7. To check collective to yaw coupling, the collective is placed fully down and the left/right pedal moves aft when it is raised.
8. How far should the pedals move?
9. When the servo check is complete, what two things should you check to ensure the systems are back to normal?
10. What is the purpose of the servos check?

SYSTEMS CHECKLIST

ITEM 9: ASE..... CHECKED

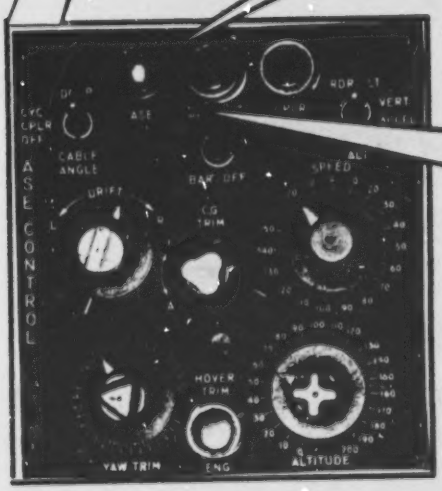
a. Power ON checks (Initial warmup time = 3 min ± 30 sec)

Purpose: To check system operation.



3. RESULT: ASE indicator light goes ON and OFF flag disappears from hover indicator.

2. ACTION: Set hover indicator to "A" mode.

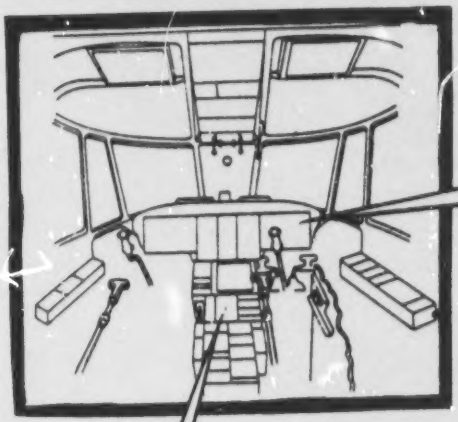


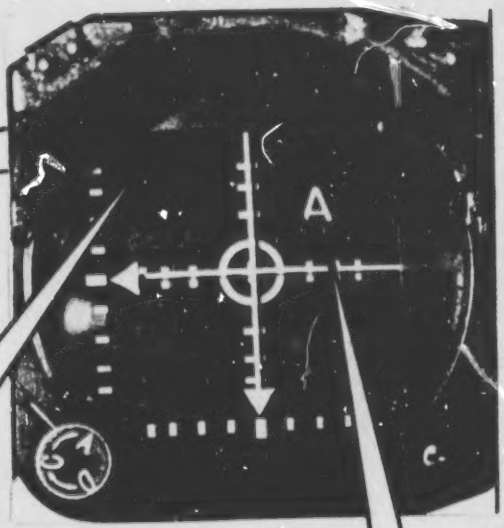

1. ACTION: Push ASE indicator light on control panel to engage ASE.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

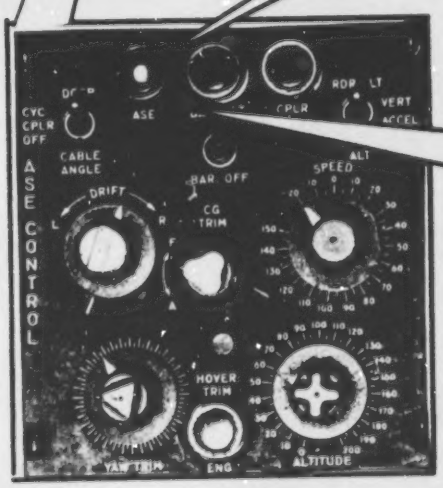
SYSTEMS CHECKLIST
ITEM 9: ASE.....
a. Power ON checks (Initial warmup time = ?min. +/-?sec)
Purpose: To check system operation.






3. RESULT: ASE indicator light goes ___ and ___ ___ disappears from hover indicator.

2. ACTION: Set nover indicator to "_" mode.

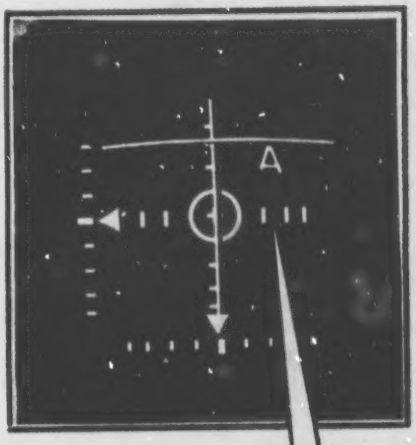


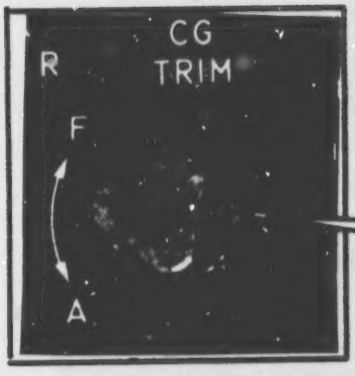

1. ACTION: ___ ASE indicator light on control panel to _____ ASE.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

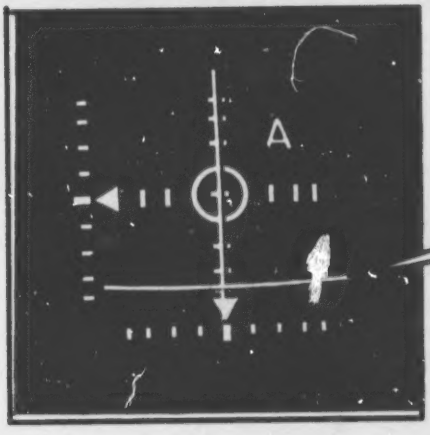
SYSTEMS CHECKLIST
ITEM 9: ASE..... CHECKED
b. CG trim check.




4. ACTION: Move CG trim knob full forward. Use caution to prevent damage to AUX servo valves.

5. RESULT: Pitch bar on nover indicator moves full up prior to end of trim knob authority.




6. ACTION: Move CG trim knob full AFT

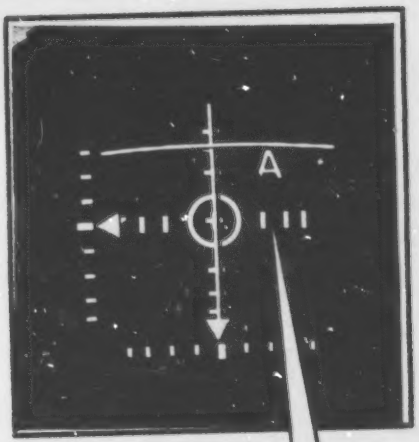
7. RESULT: Pitch bar on hover indicator moves full down prior to end of trim knob authority.

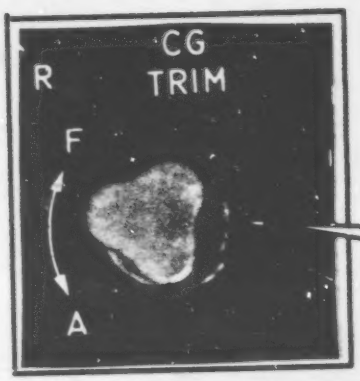
8. ACTION: Center pitch bar with cyclic centered.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

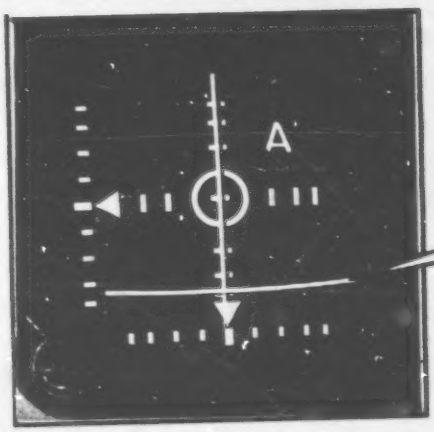
SYSTEMS CHECKLIST
ITEM 9: ASE.....
b. CG trim check.




4. ACTION: Move CG trim knob full _____. Use caution to prevent damage to ___ servo valves.

5. RESULT: _____ bar on hover indicator moves full ___ prior to end of trim knob authority.




6. ACTION: Move CG trim knob full ___

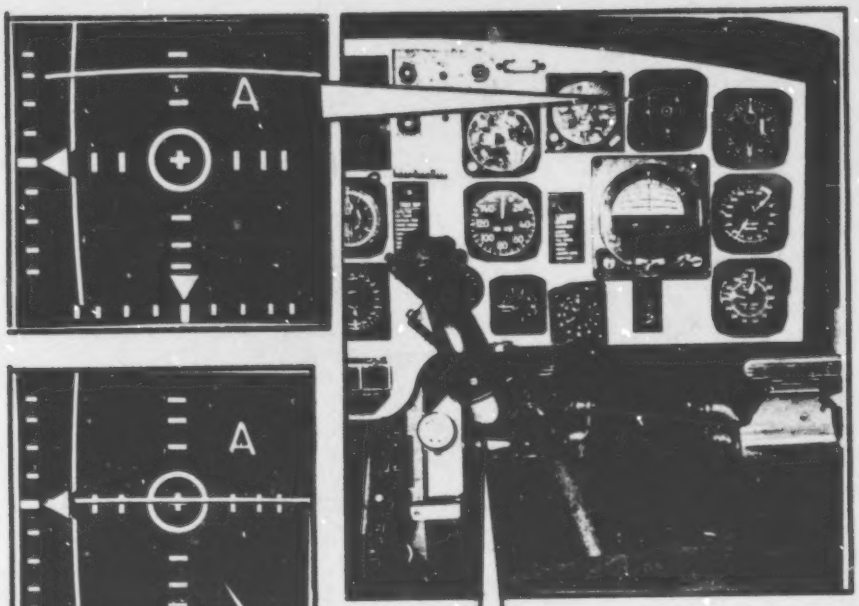
7. RESULT: _____ bar on hover indicator moves full ___ prior to end of trim knob authority.

8. ACTION: Center _____ bar with _____ centered.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 9: ASE..... CHECKED
c. Pitch/roll valve, dual channel lag amplifier check.




9. ACTION: Move cyclic to forward left quadrant, and then recenter. DO NOT use trim release.

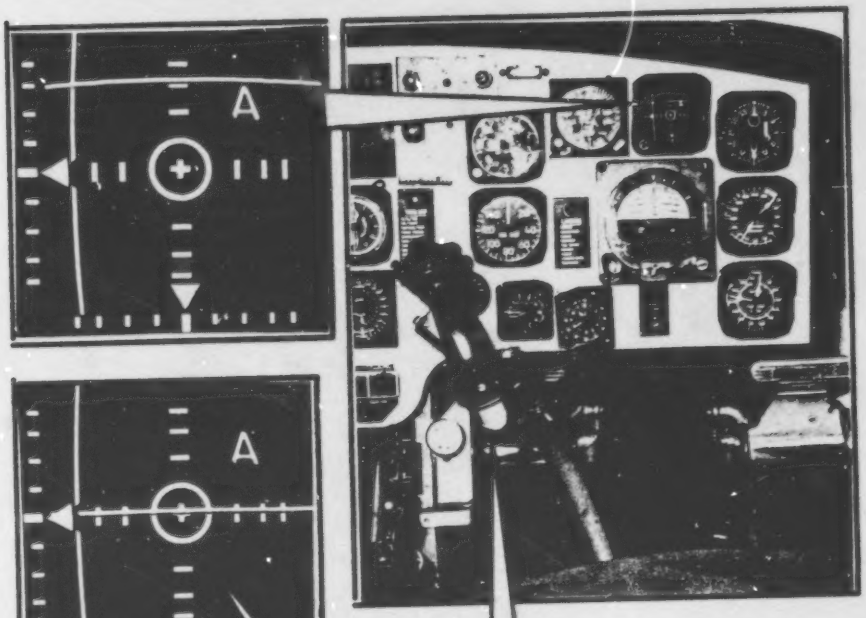
10. RESPONSE: Check pitch and roll bars follow cyclic movement and that the pitch bar precedes the roll bar to center. Maximum deflection of the pitch bar should be 2 1/2 units.

11. ACTION: Repeat check to aft and right.

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 9: ASE.....
c. Pitch/roll valve, dual channel lag amplifier check.




9. ACTION: Move cyclic to _____ quadrant, and then recenter. DO NOT use trim release.

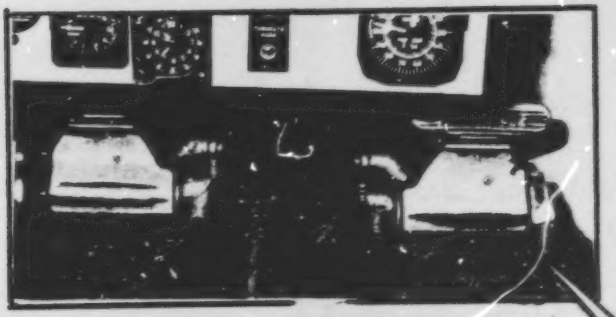
10. RESPONSE: Check _____ and _____ bars follow cyclic movement and that the _____ bar precedes the _____ bar to center. Maximum deflection of the pitch bar should be _ ___ units.

11. ACTION: Repeat check to ___ and _____.

**GO TO PAPER MOCK-UP**

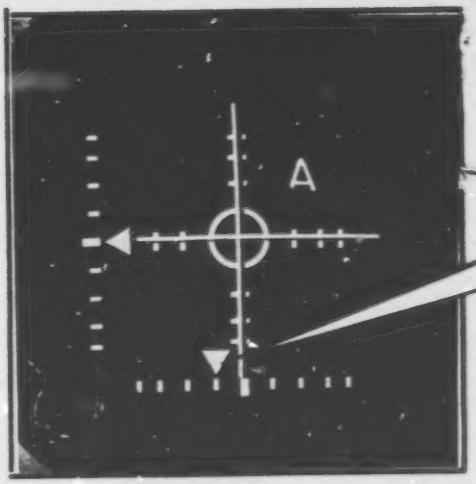
- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 9: ASE..... CHECKED
d. Yaw breakout check.



12. ACTION: Neutralize pedals, right pedal slightly forward of left pedal.

13. ACTION: Raise collective to a mid-position (about 4 inches up)




14. ACTION: Turn yaw trim knob to left.

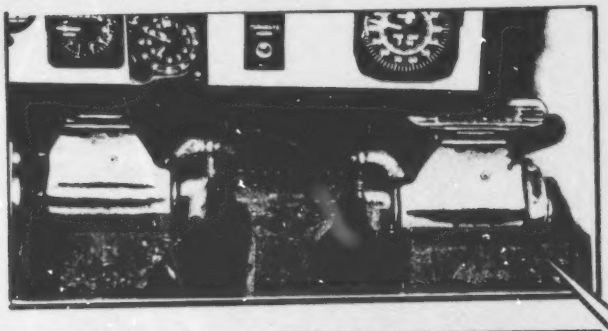
15. RESPONSE: At initial movement of pedals, check the yaw indicator between 3/4 to 1 1/2 units.

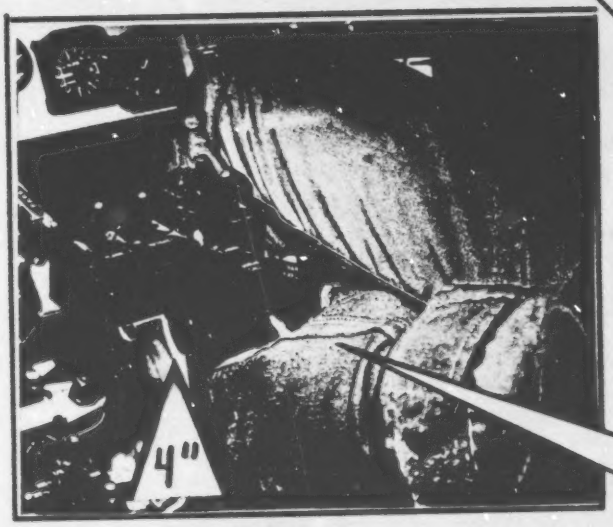
16. ACTION: Depress either pedal

17. RESPONSE: Check yaw indicator returns to neutral.

18. ACTION: Repeat parts 12 to 17 for right pedal.

SYSTEMS CHECKLIST
ITEM 9: ASE....._____
d. Yaw breakout check.






12. ACTION: _____ pedals, _____ pedal slightly forward of ____ pedal.

13. ACTION: Raise collective to a _____ (about _ inches up)

14. ACTION: Turn ___ ____ ____ to ____.

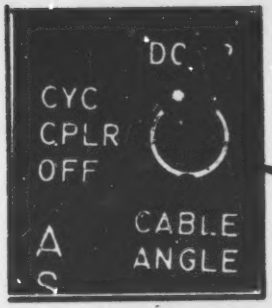
15. RESPONSE: At _____ movement of pedals, check the yaw indicator between ___ to _ ___ units.

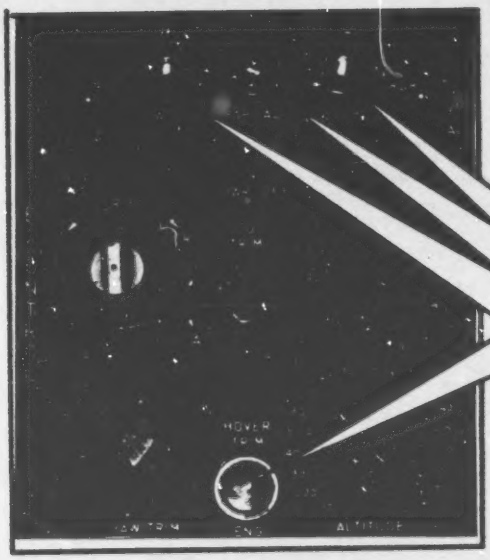
16. ACTION: Depress _____ pedal

17. RESPONSE: Check yaw indicator returns to _____.

18. ACTION: Repeat parts 12 to 17 for _____ pedal.

SYSTEMS CHECKLIST
ITEM 9: ASE.....CHECKED
e. Engage/disengage check.



19. ACTION: Switch cyclic coupler switch to DOPP.

20. ACTION: Engage ASE, BAR ALT, CPLR, and HOVER TRIM by depressing the proper indicator lights.

21. RESULT: Each indicator light should go ON.

22. ACTION: Depress AUTO STAB RELEASE button on cyclic.

23. RESULT: All "engaged" lights should go OFF, OFF flag should appear in "A" mode of hover indicator.

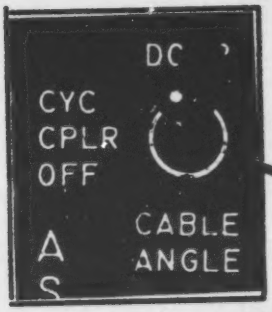
24. ACTION: Repeat parts 19 to 23 for co-pilot's side.

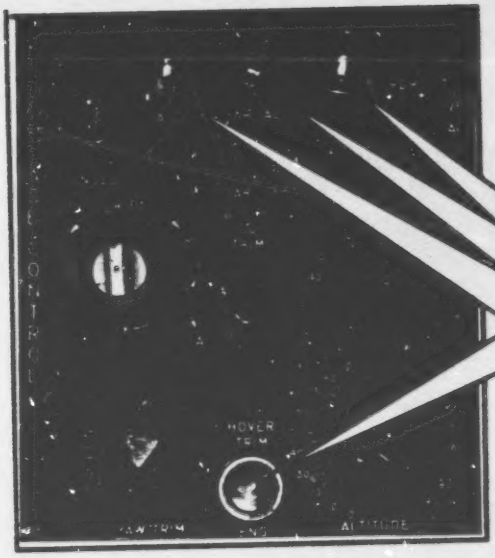
25. RESPONSE: Give reply...."CHECKED"

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
ITEM 9: ASE....._____
e. Engage/disengage check.



19. ACTION: Switch cyclic coupler switch to ____.

20. ACTION: Engage ___, ___ ___, ____, and ____ ____ by depressing the proper indicator lights.

21. RESULT: Each indicator light should go __.

22. ACTION: Depress ____ ____ _____ button on _____.

23. RESULT: All "_____" lights should go ___, _____ should appear in "A" mode of hover indicator.

24. ACTION: Repeat parts 19 to 23 for co-pilot's side.

25. RESPONSE: Give reply...."_____"

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

SYSTEMS CHECKLIST
REVIEW: ITEM 9

**GO TO PAPER MOCK-UP**

- Step through all items
- Touch where each action and response takes place
- Recall exact action for each item

Item 9: ASE.....CHECKED

Review Questions:

1. What is the initial warm-up time before checking the ASE system.

2. How is the ASE system turned on?

3. Name two indications that ASE is on.

4. ASE inputs drive valves in the PRI or AUX servo systems?

5. T or F. The pitch bar should stop moving prior to reaching full throw of the CG trim knob.

6. T or F. Use the trim release when doing the ASE cyclic checks.

7. Checking the pitch bar centering before the roll bar is a check of the _____ _____ _____ _____.

8. Yaw breakout should occur from _____ to _____ units.

9. What is the purpose of switching the cyclic coupler switch to DOPP before performing the engage/disengage checks?

10. Describe the location of the switches used to release the following ASE controls:

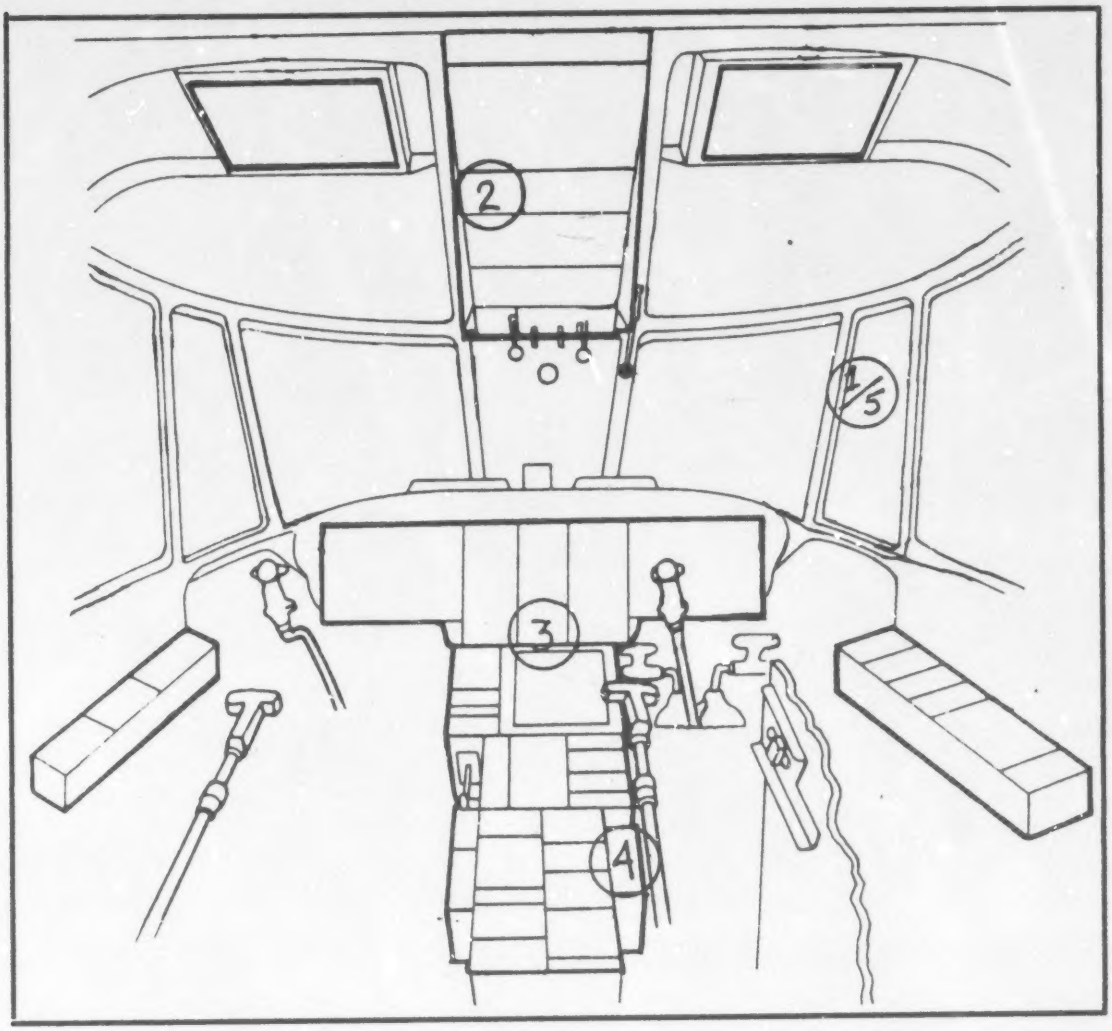
    a. Hover trim:
    b. Coupler:
    c. BAP ALT:
    d. ASE power:

SYSTEMS CHECKLIST
ITEM 10: Coupler/Doppler checks.....AS DESIRED
ITEM 11: Navigation equipment check.....AS DESIRED

These items are optional in the checklist and are not covered at this time. Separate Procedure Training Aids for each check are available in the ISD library. Prior to beginning your "B" stage flights in either the motion based trainer or the aircraft, you should complete both of these aids.

CONTINUE WITH REVIEW ON NEXT PAGE.

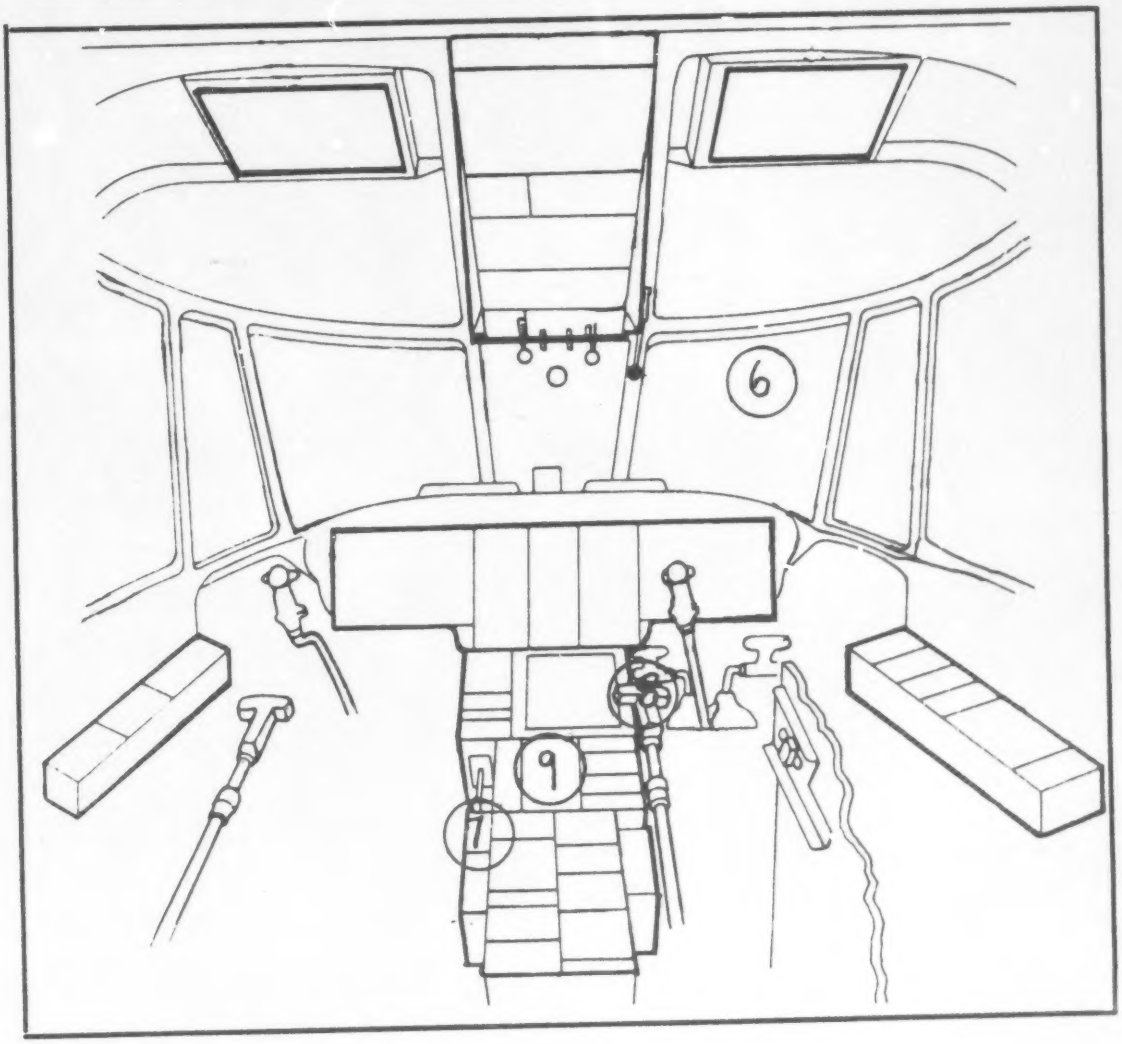
1. Area clear.....
2. Blades.....
3. Hoist and hoist ICS.....
4. Flotation gear.....
5. Head check.....




**ROAD MAP**

- With your finger, trace the steps
- Recall (1) how to perform, (2) systems response
- Look up answers if you need help
- Keep practicing until you can describe steps without error or hesitation

6. Rotary wing head.....
7. Drop tank pumps and indicators (SH-3H).....
8. Servos.....
9. Basic ASE.....




**ROAD MAP**

- With your finger, trace the steps
- Recall (1) how to perform, (2) systems response
- Look up answers if you need help
- Keep practicing until you can describe steps without error or hesitation

## REVIEW QUESTION ANSWERS

A. ITEMS 1,2,3 (page 9):

1. Right window and rear view mirror.
2. People and where they are, yellow gear, fire bottles, FOD, other aircraft.
3. Primary hydraulic pressure will be applied to the head and damage could result. (See "CAUTION" page 3-15, D/H NATOPS)
4. Yes. No. 2 must be off to get power to the blade fold system.
5. Off, to avoid putting unnecessary inputs to the system.
6. a. Blades folded--Safety light ON, control lockpins light ON, blades folded light ON.
   b. Safety valve ON--no change.
   c. Master switch ON--fold power light goes ON, No. 1 blade position light ON.
   d. Blade fold/spread switch to spread--blades folded light goes OFF, control lockpins advance light OFF, blades spread light ON.
   e. Safety valve closed--safety valve warning light OFF, fold power light OFF.
   f. Master switch OFF--No. 1 blade position light OFF, flight position light ON.
   g. Blade fold/spread switch OFF--no change in lights until shifting from accessory drive to flight.
7. Arms crossed across chest moving to the open position. P/C replies with same signal and indicates the number of blades moving by wagging the appropriate number of fingers on each hand, until all the blades have spread, and then gives a thumbs up.
8. After you close the safety valve switch.
9. Blades spread, flight position.
10. Look in the rear view mirror and see it move, or watch the utility hydraulic pressure gauge flux.
11. Number and type of smokes aboard, number of matrix lights, status of SAR box.

B. ITEMS 4,5,6,7 (page 15):

1. Rotate test switch through each position, check indicator light ON.
2. (See NATOPS pages 5-50 and 5-52, part h.)
   a. Arming switch--ARMED.
   b. Inflate switch--depress. NOTE: It may be necessary to depress the switch several times to fire the bottles on both sides.
3. Tap helmet and give a thumbs up.
4. a. Hand extended and pulled toward the plane captain's body.
   b. Hand moved from body outward, shoulder high.
5. Cyclic and collective to move the three primary servos up and down to check for leaks and security.
6. To ensure the rotor brake pucks are not dragging.
7. 1/8th revolution.
8. SH-3D and SH-3H, group D and subsequent.
9. Green.
10. Red.

C. ITEM 8 (page 23):

1. 1300-1600 psi.
2. F.
3. Up.
4. About 4" up or a mid-position.
5. 1/8" in cyclic, 1/16" in collective and rudders.
6. Wait 12 to 15 minutes for the system to warm up and try again.
7. Left.
8. About 2".
9. Pressure gauges and caution lights.
10. Check system operation and control binding.

D. ITEM 9 (page 29):

1. 3 min. $\pm$ 30 secs.
2. Push indicator light.
3. Indicator light ON, no OFF flag in A mode on hover indicator.
4. AUX
5. T.
6. F.
7. Dual channel lag amplifier.
8. 3/4 - 1 1/2.
9. To be able to engage hover trim.
10. a. Cycle cyclic coupler switch to OFF.
    b. Lower right side of collective.
    c. Upper and forward right side of collective.
    d. Lower forward left side of cyclic.

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